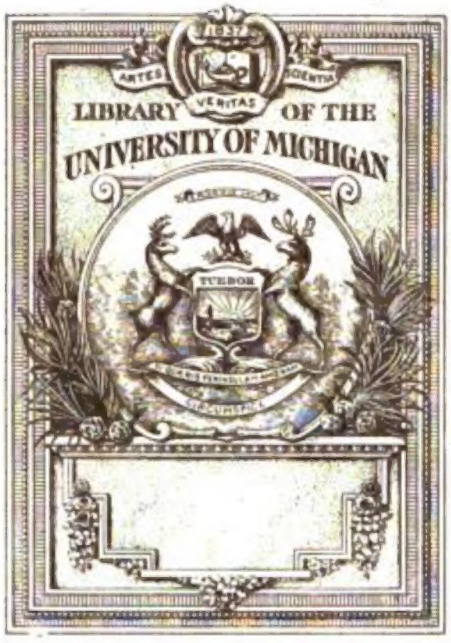
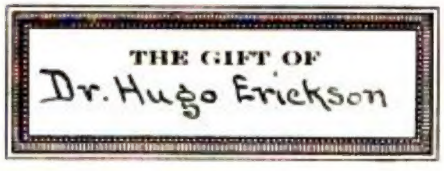
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THE

PHOTOGRAPHIC TIMES

AN

ILLUSTRATED MONTHLY MAGAZINE

DEVOTED TO THE INTERESTS OF

ARTISTIC AND SCIENTIFIC PHOTOGRAPHY.

VOLUME XXIX.

1897.

EDITED BY

WALTER E. WOODBURY.

NEW YORK:
THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION.
1897.

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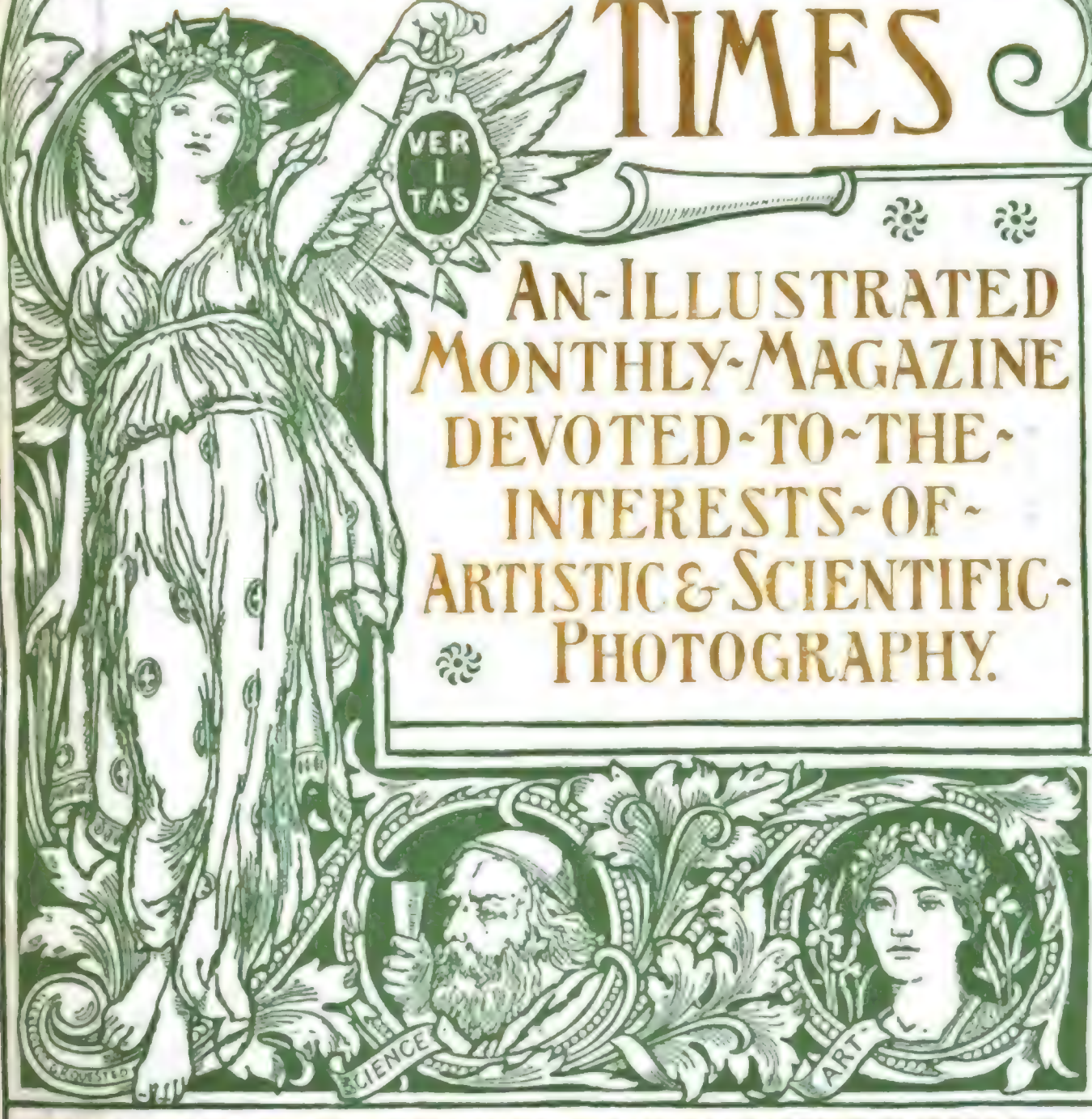
JANUARY, 1897.

Number 1.

FOUR DOLLARS PER ANNUM

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THE PHOTOGRAPHIC TIMES



AN·ILLUSTRATED MONTHLY·MAGAZINE DEVOTED·TO·THE· INTERESTS·OF· ARTISTIC & SCIENTIFIC· PHOTOGRAPHY.

THE·PHOTOGRAPHIC·TIMES·PUBLISHING· ASSOCIATION·60·AND·62·EAST·11TH·ST.·NEW·YORK.

THIS ISSUE COMMENCES A NEW VOLUME.

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THE VILLAGE CHOIR

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THE PHOTOGRAPHIC TIMES.

VOL. XXIX. JANUARY, 1897. NO. 1.

THE UNPHOTOGRAPHIC PHOTOGRAPH.

BY E. LEE FERGUSON.



CARMEN
BY E. LEE FERGUSON

THERE are photographs and photographs. Some persons think that there are photographs and pictures. Some of us are imbued with the idea that a photograph itself may be a picture. We often hear a picture, regardless of the process by which made, criticised as being "too photographic." This is unquestionably perverting the meaning of a good word, as "photographic" means pertaining to photography or obtained by photography, while used in the above sense it is not properly applicable to everything obtained by photography. It is not fair to those who uphold pictorial photography to restrict this word to one class of work, any more than it is fair to insist on calling all makes of cameras "Kodaks" The time has arrived when a new political party should be launched for the purpose of securing legislation that shall preserve the purity—what there is left of it—of our language. Prohibition, immigration, the pernicious effects of bicycling, should all be laid aside, and this vital question receive the attention of all the reformers and statesmen—"out of a job."

A photograph is a photograph because it is made by photographic processes without regard to the merits or demerits of the result. An oil painting is an oil painting because it is painted in oils, though the person who handles the brush is not necessarily an artist. It is so easy to make a photograph that shall reproduce everything, that the wonder and admiration excited thereby has led photographers and opticians to pursue with the greatest vigor this scientific side, and to the great mass of people this alone is photography, properly so called. There are varying grades in all work made by whatever method. When we speak of a painting we naturally have in mind examples of the best work in that line; when we mention photographs we eliminate from consideration the best qualities of artistic photography. We overlook the fact that a painting is not necessarily a work of art and that a photograph is not necessarily a crude, hard, exact representation of some object or scene. We give painting more than its just deserts and fail to recognize what good there is in photography.

In country towns a "genuine oil painting" will be given with a "cook stove" or with every purchase of a few dollars' worth of dry goods. These things are unquestionably oil paintings, but as works of art are on a level with the cabinet photographs at two dollars per dozen with "one of our beautiful life size copies, suitable for framing, free." A painting is a painting whether it is executed before a gaping crowd in six minutes, or a canvas on which the hand of Corot has stamped the impress of his mighty genius. A photograph is a photograph whether it be the blind, mechanical work of the peripatetic "artist," or a picture filled with the poetry and imagery that

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a Davison or a Farnsworth may infuse into their work.

At a photographic exhibition that brings out the work of those who combine art with science,



EASTER LILLIES BY E. LEE FERGUSON

we hear surprise on every hand that certain pictures are photographs. The unphotographic photograph is not new. Its supporters have always made noble efforts in its behalf, but it has been swept to one side by the deluge of photographic work that is undeniably purely photographic and mechanical. These pictures that may cause an artist a thrill of delight will arouse antagonism among many who appear to fancy that someone is attempting to get beyond the fixed scope of photography. Whether photography is an art is of little value to discuss. It is a method, and the point to consider is whether the result is artistic. To say of this result that it resembles an engraving or an etching is a poor form of commendation. Quantities of mediocre—and worse—engravings and etchings may be found with ease. Engraving, painting, etching, photography—all are methods of producing something that may or may not have artistic qualities. When a picture produced by photographic methods bears the impress of the artist's individuality, satisfies the eye, and appeals to the imagination, too many endeavor to hide the method and praise it for a fancied resemblance to another form of work, considered—properly or improperly—of a higher order. So it is that the highest form of photography becomes, to the general mind, unphotographic.

There are limitations to photography, but the production of really artistic work is possible within these limits. A photograph remains a photograph however high it may rank as an artistic creation. The limitations of the method should be studied and appreciated, and then the more the broad underlying principles of art are applied to the making of the negative and the print, the more we shall see of the unphotographic photograph. May we see more and more of it until we shall recognize it as merely a higher form of the varied results of a method. Then will we not take its own name from it or feel that in so calling it we are casting reproach. Then there will be no "unphotographic photographs" and the class which I have now so designated may be recognized by all as works of art.

"With a short-focus lens it is impossible to obtain any true foreshortening, and every photographer gets so accustomed to this false perspective that he accepts without a thought of objection effects that would drive an artist wild. . . . The man who studies art *after* learning the *science* of photography is handicapped, he is apt to be misled by scientific and optical limitations, and to accept the result of those limitations as truths."—*G. Hammer Croughton, Photographer.*

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THE TWO CHIEF PHOTOGRAPHIC EXHIBITIONS OF THE YEAR. I.—THE ROYAL. BY HECTOR MACLEAN, F.G.S., F.R.P.S

In endeavoring to give the readers of this journal some information and comments respecting the high-water mark of photography in Britain during the year 1896, as is more particularly exemplified by the exhibitions of *The Royal Photographic Society of Great Britain* and by *The Photographic Salon*, I have thought best that the article should be acknowledged, as coming from my pen rather than that my notes of admiration or of stricture should be shielded by the plural pronoun. For all criticism is so purely personal that its value, or worthlessness, depends entirely upon the individual; moreover, many a sensitive artist, palpitating maybe with those hopes and fears, elations and depressions, which, cyclonic like, sweep through the breasts of the brethren of Marie Baschkirtseff, will be more resigned at the blame of a known scribe—and perhaps less intoxicated by his praise—instead of, as sometimes happens, going into hysterics over the profound pronouncements of WE, which, did he but know it, is perchance nothing more than the awe-inspiring personification of the office boy.

Finally, being alone responible, I have a freer hand for errors of taste or of judgment. None the less it should be remembered that although merely speaking as one, I am, to a large extent, the unconscious voice of my environments, and write the following remarks with the echoes of many *obiter dicta* ringing in my ears and willy nilly, controlling my pen.

Yet just this more by way of introduction, so that I may be in complete *rapport* with my readers.

Pictorial photography has been classified in a good many different ways. For the present, my own predilections impel me to divide all such productions into two broad categories, viz., that which I term "The Robust" and that which may be called "The Emasculated." By robust I mentally picture works which make full use—or nearly so—of the native virility which is inherent in the particular photographic processes employed in the rendition of the picture under consideration. By emasculated I refer to what may be considered as photography's lost opportunities; as where clogged, or vapid, shadows—which are not evidently called for by the exigencies of composition—replace passages of enchanting gradation: or, contrarywise, where a vision of modulation and roundness of form, full of flashes of light and shadow, is translated by a weak grey expanse of dimness. Need I say that I lean towards the robust school? Therefore, I hope if those who are my friends should think I, at times, bear unduly hard upon the emasculated, they will indulgently absolve me from wilful unkindness and remember that my preference is not with the misty works.

Commencing with the Royal Photographic Society's display, one cannot, on entering the gallery, but be instantly struck at the great change which has fallen upon the walls. Practically speaking, the "show case" element is eliminated; almost as obsolete is the light mount, whilst passing away as being somewhat



WILLOW WREN BY R. B. LODGE

worn out are those theatrical and forced landscape effects taken "against the light" which, until this present year, were so much in vogue with several of our leaders.

The craze—if I may so term it—of the moment seems to run in the direction of exaggerated vagueness and darkness, occasionally accompanied by much gross affectation of unpremeditation. As where, for instance, we have a portrait with the top of the sitter's head chopped off by the frame. (No. 300, Salon.)

Of course, such "qualities" as the before named have been always noticeable as exceptions. To-day they are inclined to be the rule. Hence, the first impression of the Royal Photographic Society's Exhibition is that of dolefulness, but further examination reveals much to qualify such a conclusion.

It will be, obviously, impossible—and prob-

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ably not profitable—to consider and descant upon all those pictures which offer a text for critical remark. I shall, therefore, here mainly, although not entirely, confine myself to (1) the medalled works, (2) to the exhibits of those of my confreres as hail from Columbia, and (3) to those which are illustrated in the text. Of



LOWESTOFT EDGAR SCAMELL

the medalled works, it may at once be said that the judges have performed a most difficult task without grave injustice. First of the medalled works, in every way, is the portrait study upon artigue paper by Philipp von Schoeller. This is quite a triumph, both for the printing process and for the photographer; none the less in a work upon which "that fierce bright light" of a hundred art specialists falls, it is not possible but that minor faults should be spoken of. How this picture is esteemed depends very much upon the day; when the light is brilliant—and even London knows what sunshine is—then is there noticed some inclination to chalkiness about the lighter passages; on the other hand, when the picture is less intensely illuminated, the face and ruff are merged into a spot of brightness encompassed by gloominess which seems to call for a subsidiary light that should destroy the not quite pleasant feeling of isolation.

In "Trau Cathedal, Dalmatia," Mr. John Bushby has not only gone off the beaten track of ecclesiastical subjects, but has produced that which, as seen at the Royal Photographic Society's Exhibition, is less an architectural study than a picture in stone, made impressive by that rare "audacity of shadow" which John Ruskin, in *Aratra Pentilici*, declares to be a not unwelcome attribute of a good photographic rendering of sculptured form. In the presence of the reproduction, verbal description is uncalled for. Only this, that the original picture possesses a combination of color, tone, and surface, which very materially heightens its æstheticism, and makes one think of some of the late David Roberts' interiors.

Out of a number of 12 x 10 platinum prints of English cathedrals, one, of the "North Choir Aisle at Norwich," by J. Bulbeck & Co., has been singled out and medalled. Apart from the difference of subject, this and the preceding picture are very dissimilar in execution. Messrs. Bulbeck present us with smooth, well-developed scales of gradation and with prints noticeably free from the troublesome technical defects so apt to assert themselves in this class of work. In fine, their work is the essence of correctness and, besides, may boast of considerable pictorial quality.

Next on our list is Mr. W. Thomas's "Ebb of a Winter's Day," which is one of those presentments that depend for their appreciation upon a sympathetic beholder. Such a one will on doubt find much to which his admiration will respond; this, despite some wooliness of form which suggests that not only the snow, but all the rest of the objects had begun to thaw.

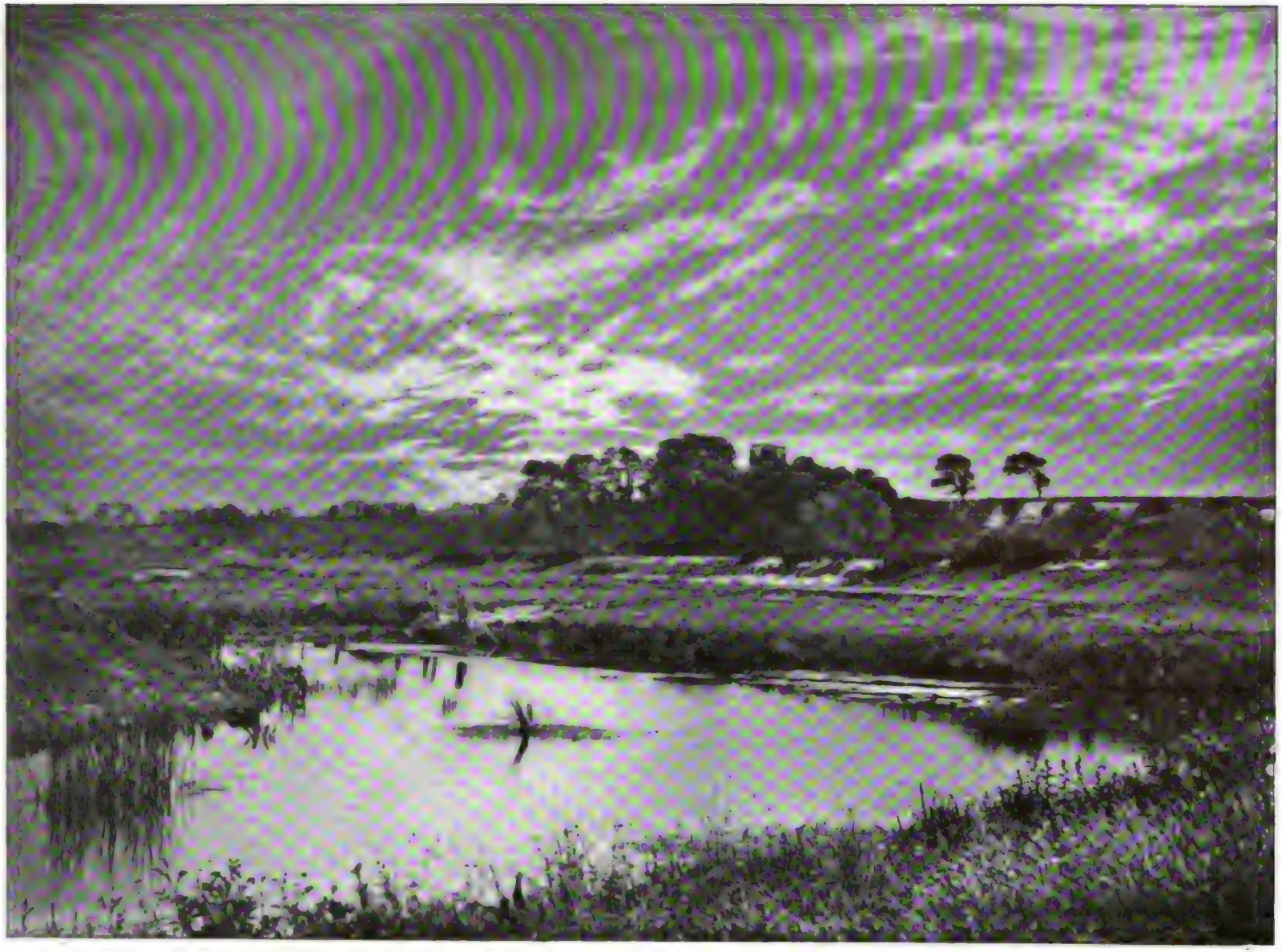
Another medalled work on the same wall is "A Decorative Panel," by Alfred Stieglitz.



DABCHICK ON NEST BY R. B. LODGE

Here we come upon a striking composition, noticeably for the severely limited plane, and radius of definition, which is focused upon the foreground; it is, moreover, eloquent of the photographer's nice appreciation of the interaction of mass and line, and is a successful example of the possible advantage of figures in

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NEAR SUNSET
BY CHARLES JOB

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A WAYSIDE SHRINE BY E. CECIL HERTZLET, F.R.P.S.

the making of a subject which would otherwise be "hardly good enough." In that it is rather dull in the tone of its high lights and is deficient in the full power of its shadows, it somewhat leans toward the emasculated school, for all which, it has a reposeful charm which cannot be gainsaid.

Dr. George Macdonald's "Roses" are good inasmuch as many are worse. At the same time, I cannot ungrudgingly approve this bowl full of blossom. The exhibited print is heavy, suggesting rather fleshy or wooden flowers, than the "queen of all." They also give the impression of having been just hurriedly jammed into the Nankin basin, and are hence unduly crowded together; the whole subject, too, has been taken upon a plate several sizes too small. It results that the eye inclines to weariness by reason of the labarynthine multitude of petals, all folds and involucre; to make matters worse, the frame gives one no rest with its ornate boarder of aggressively twisted and curling gold moulding. For all which the composition rejoices in many strong points, as my readers may see for themselves by reference to the accompanying reproduction.

"Waiting for the Wind," by Mr. C. F. Inston, is a sea piece treated in a manner which is in many ways quite after my own mind, for it enshrines certain fundamental points which should, in my estimation, characterize a high-class photographic picture. These include a full measure of force, light, shade and gradation, employed with such artistic effect as shall ensure that each of the above heightens the influence of the others, and that all combine together in such manner that the picture shall not seem to be the result of a fortuitous combination of blind atoms. That Mr. Inston's works are due to informed aim and deliberation is evidenced by the sustained power of all four of his exhibits.

Finally, of the medalled work remaining, we have Mr. Paul Martin's "Around London by Gas Light," a series of twelve lantern slides, which are mainly wet night scenes in the streets of the metropolis, and which form a clever,



THE PICTURE GALLERY, STAFFORD HOUSE (SEAT OF THE DUKE OF SUTHERLAND)
BY H. BEDFORD LEMERE

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AN APRIL MORNING BY J. CARPENTER

interesting, and original *tour de force;* and a none too wonderful set of the inevitable X-ray photographs, by Mr. Wilson Noble.

Turning to the works of American exhibitors, which I deal with strictly in catalogue order, first come two by Mr. Oliver W. Huntington. In "A Fancy Portrait," we have a low-toned, full face of a none too interesting model treated with considerable power. The figure strikes one as being rather cramped and needing for its adequate presentation a larger plate; the second work, "In an Attic," displays much skill in pictorial arrangement. But there is an abiding air of unreality about this modern young lady and ancient spinning wheel, which the title of the picture does not quite dispel.

Mr. Dexter Thurber's old harridan who warms her chilled fingers at a brazier upon "A Cold Day," is commendable enough in motive and technique; the print, however, loses much by its distracting surround. The picture is of a warm brown hue whilst the broad mount is of a pale gray with an inclination to greenness that makes the setting too self-assertive. In "Christmastide," by Mr. Floyd Vail, we come upon a snow scene which inevitably challenges comparison with Mr. R. Eickemeyer's "Home, Sweet Home," (medalled in 1894). It is no disparagement to Mr. Vail's production to say that the latter must "give best" to the former. None the less does it testify to much sound appreciation of those qualities which should be present in a depiction of midwinter clothed in white. The net effect would, however, be considerably improved by slightly masking the high lights, by stronger printing, adding a darker sky, and replacing the present mount with one which is darker than the picture's half-tones.

Mr. Clarence B. Moore has set himself a hard task in personifying hatred, or "La Haine," as he prefers to call his malevolent looking head. All such subjects, whose motive is a displeasing one, can never commend the same approval as might less forbidding themes. The print,admirably as it in many respects conveys the wished-for sentiment, is somewhat marred by an inclination to spottiness, nor is its native cold-

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ORANG OUTANGS HENRY SANDLAND



SEA LION HENRY SANDLAND



ZANZIBAR OSTRICH HENRY SANDLAND



DAISY, THE NEW GIRAFFE AT THE LONDON ZOO
HENRY SANDLAND

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ness of tone improved by a pale cream mount. It would be better suited by a deep frame of a dull, dark green hue.

In "Easter Lilies,' Mr. Eugene L. Ferguson is here represented by a delicate child study of the semi-draped order, rendered in a style greatly reminiscent of silver point. The work is one which captured my fancy at sight; it possesses the rare quality of making the beholder wish for just a little more of that which seems so attractive.



A BRIDGE ON THE STOUR BY J. CARPENTER



MARSH MEADOW BY J. CARPENTER

Finally, of American contributions are the thirty lantern transparencies of flowers by W. A. Fraser, who is somewhat unlucky in exhibiting his collection at a time when the general excellence is higher than usual. Otherwise, it would have been all but certain that his accomplished and even set of flower pieces would have scored, for they are all very exquisitely pictured floral beauties. I can only suggest that the dead black background is unnatural and, to me, unpleasing. Moreover, the size of the flowers, when projected onto a ten feet screen, is brobdignagian, which I very much dislike.

Of other pictures, which do not fall within the foregoing classifications, mention may be made of the following: Mr. E. Cecil Hertzlet's "A Wayside Shrine," which is a touching reminder of that implicit faith yet lingering in southern climes and amongst Latin races. Somewhat allied in sentiment is Mr. Alex. Keighley's "An

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Alpine Cross," which is somewhat robbed of its full effect by the "plummy" brown of its tones. Mr. John Carpenter's three landscapes displayhis talents in an unusually good light. Best of the trio is, without doubt, "Marsh and Mead," which is both unaffected and effective. Mr. Cohen's "Study of a Head" recalls some of Mrs. Cameron's work and possesses similar attraction. "All the world wondered" on first beholding Mr. Warneuke's "Portrait"; later on, it was remembered that he lives amongst the young bloods of the Glasgow school of painting revolutionists. Hence, no doubt, the foregoing pictorial manifesto couched in the language of the prophet Whistler.

George Lamley's "After a Storm" is a delicate gem of sea and sky, over which W. L. Wyllie, A.R.A., is said to have rhapsodized. Of his others, "In a Dead City" may be placed first.



"ROSES" BY D. GEO. MACDONALD

Amongst photographers who on account of their strenuous work deserve, although they have not yet obtained, the official meed of approval, is Mr. John A. Hodges, who is this year represented by as many as five pictures. Truth to say, none are as attractive as the best of his last year's prints; none the less, a riverside eventide effect, "When the Sun is Low," is an unaffected presentment embodying passages of considerable charm. Amongst the very few professional portrait exhibits may be noted a triptych by Mr. Edgar Scamell—who is best known by his hundred or more photographs of "London Street Cries"—which represents three aspects of a delightful little girlie, portrayed with much delicacy and daintiness. Mr. Charles Job contributes but one example of his accomplished style, "Near Sunset," of which the accompanying reproduction fails to convey a full measure of the glowing warmth and color of a summer sundown, suggested by the red-brown carbon of the original print. Mr. H. Bedford Lemere has mirrored the splendors of Stafford House with a perfection which he has taught us to expect.

Amongst those who show good and interesting pictorial work may be mentioned E. R. Ashton, F. A. Crew, Hugo Meynell, Henry Smith, Gay Wilkinson, Gale, Cembrand, F. Hollyer, J. Sinclair and Kidson Taylor. Outside those photographs which make strongest claim to attention, on account of their artistic aims, are a number of not less interesting exhibits which appeal to the visitor for various other reasons. Amongst these are the striking zoological studies of Henry Sandland, taken with an appreciation of the scientific points which should be present in such records, that is not often equalled. Some of the pictures have only been obtained after waiting for a year or more in order to catch the animal in a required

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pose. Less sensational, at first sight, are the very engrossing actualities of wild bird life, secured by Mr. R. B. Lodge, by means of a long focus lens and a long-suffering patience; in order to get some of his studies Mr. Lodge has, before now, tied himself up in a sack and lain for hours in a wet ditch. The utility of the Magnesium Flash-light is exemplified by Dr. Page May's "Contemporary Royal Portraits," of Aahmes and others belonging to the ruling Egyptian families of 3,000 years ago. Of considerable intrinsic value, and of admirable technical quality, is the "Davenant Bust of Shakespeare," by the accomplished Mrs. Catharine Weed Ward, better known to many Americans by her maiden name of Catharine Weed Barnes. Another American who takes a high place in the scientific division is Mr. Henry Troth, whose faithful and well-defined botanical examples are almost beyond improvement; the only point which I can suggest whereby a better result would be obtained is that the prints should, in each and every case, be *absolutely* life-size, and no more.

The new apparatus consists mainly of articles which depart very slightly in size, or in minor detail, from those in previous use; exception may be made in favor of the instantaneous flange, which is an inexpensive and time-saving adjunct to a camera that should find favor in the eyes of all tripod camerists, especially those who love to ring the changes upon half a dozen or so of lenses.

In concluding these remarks upon the "Royal" Exhibition, let me thank the several exhibitors who have kindly responded to my request for prints to accompany my critique. Some of the prints will, I fear, arrive too late for inclusion herewith, but will appear with the subsequent article devoted to *The Salon*.

BINOCULAR VISION. BY GEO. A. SAWYER, U.S.N.

Probably the most perfect example of the photographer's art is the stereoscopic picture, when the subject is well chosen. Prints made in the form of transparencies, on glass, and viewed in a proper instrument, the resulting impression on the mind comes nearer to that of the actual scene than any other process yet discovered, and it is a source of congratulation that interest in this method of picturemaking seems to be awakened.

I have mentioned a stereoscope as one of the apparently essential elements in the combination above which goes to make up the successful result upon the mind of the observer, and gives to the flat pictures the relief and perspective of nature. Such, however, is not the case. Stereo pictures may be viewed by the unaided eyes quite as successfully as by the aid of the stereoscope, and the power of controlling the necessary muscles of the eyes to accomplish this result is easily acquired by anyone who will take the trouble to read this article.

The principal function of the lenticular stereoscope is to enable the right eye to see the right-hand picture, and the left eye to see the left picture. Incidentally the lenses may magnify a little, but that is not essential. This being the case, we may discard the instrument, and all we need to do is to look directly at the right picture with the right eye and the left picture with the left eye, and we have exactly the same relief and perspective that we get when using the stereoscope.

The ability to do this involves the power to control, by direct action of the will, muscles which we ordinarily use automatically, and, therefore, unconsciously.

When we fix our eyes on a single letter of this printed page, held at the ordinary distance for reading, lines passing through the axes of our two eyes converge and meet at a point, say, twelve inches distant. When we raise our eyes to the sky the lines passing through the axes meet in infinity and the rays are practically parallel; we have simply rotated the axes outwardly. Now, this is exactly what we want to do to see a stereo picture in relief; we must hold it at a convenient distance from our eyes and look at it as if it were at an infinite distance.

Many persons will find that they can do this at will; others will require a little practice. Stand in front of a window, moisten a bit of paper a quarter of an inch in diameter, and stick on the glass opposite the eyes. Looking past the paper at the scene outside one becomes conscious that there are two bits of paper; that is, the parallel rays from each eye take cognizance of the spot. Place a second bit on the glass at a horizontal distance equal to the interval between the eyes, say two inches; then looking at the distant scene the eyes take cognizance of four spots. By-and-by the two middle ones coalesce and seem to melt into each other, and this is the image which, when

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pictures are substituted for the bits of paper, forms the relief, or image in perspective.

Substituting for the bits of paper a stereo picture, and using the eyes as we did before the glass, we get as the result a picture exactly similar to that produced by the stereoscope.

Most stereo pictures are wider between centers than the normal distance between the human eyes, and to see them successfully necessitates the eyes being rotated outwardly, so that the rays are not parallel but diverge. This requires practice, but when the control is once acquired it is very pleasant to look over a collection of stereo pictures without the necessary dependence upon the stereoscope.

All this is old and elemental, and I have restated it in order to call attention to the fact that two prints from the same negative, viewed in this way, present a relief and perspective, it seems to me, quite as marked as if produced by two lenses. Take duplicate cabinet heads and look at them as suggested, and you will be surprised to find that the image detaches itself from the paper, steps out to the front and assumes a plastic form which carries a charm no flat picture is ever capable of, and one is conscious of new and undiscovered beauties in the work, and, alas! defects also.

EIKONOGEN. BY JOHN J HIGGINS, A.M., M.D.

You cannot make a solution of Eikonogen grains 12 to the ounce, hold more than twice its weight of powdered sulphite of soda without precipitation on cooling.

Avoid ammonia and its salts—also all acids; either is positively harmful.

Keep the developer in separate solutions. The one of simply Eikonogen and sulphite of soda in one bottle; the other of carbonate of potash, etc., in another, and mix in the desired proportions at the time of use.

Do not use in, or add to the Eikonogen solution either carbonate or sulphite of *potash*.

If in daily use the Eikonogen solution may be kept in quantity in a stock bottle. If not, *fill* smaller bottles with the quantity required for the compounding of your developer. Glass stoppers always.

The alkaline or carbonate of potash solution may be kept in any sized bottle. If cork stopper is used it will be acted upon by the alkali with consequent discoloration.

The addition to the developer of hyposulphite of soda within certain limits adds greatly to its energy and power, doubling, or even trebling it, with, however, a disposition to fog, and the negative obtained is not as satisfactory as usual. It is not to be recommended, but is at times useful, as in cases of necessity or as a *dernier resort*.

Potass ferro-cyanide acts as a restrainer and in some way *sui generis* is beneficial. It can be added to the Eikonogen solution, and my observation inclines me to the opinion that it helps to keep it from change.

The addition of borax to the developer *does not* hasten or strengthen its action, as stated, but the *reverse*.

It is claimed by "Burton" that Eikonogen grains 5 ad unciem and Pyro grains 2 ad unciem give equal rapidity of development.

According to "Reeb" it requires to reduce one part of Silver nitrate, of Eikonogen 0.33 and of caustic potash 0.33 or 0.235 of caustic soda, or 0.406 of carbonate of potash, or 0.841 of carbonate of soda, and that the quantity of sodium sulphite required to keep the solution colorless (whether caustic alkali or carbonate is used) is ten times the weight of the Eikonogen. In the absence of alkali five times its weight.

Eikonogen aids quinol, but nothing is gained by the addition of quinol to Eikonogen.

A second plate in the bath requires one-third longer time than the first one, and for a third plate the operation is so tedious, that it is practically useless.



"The beginning of the end"
BY J. DE BRUYN KOPS

CYCLE AND CAMERA. BY DR. HUGO ERICHSEN.

THE bicycle is come to stay, not only for business purposes and cheap transportation, but as a blessed means of recreation to countless townspeople, who are cooped up in their work-rooms during the day, and can only enjoy an outing during the evening and on Sunday. The immense popularity which the bicycle has enjoyed during the past year has caused manufacturers to vie with each other in the production of various appliances to the "steel pony" and the outfit of the cyclist. One of the latest additions to the cyclist's equipment is the bicycle camera. I am aware of the fact that a bicycle camera was on the market for many years, but it was not as practicable as the latter invention, which may be called perfect.

I have seen two bicycle cameras, both of the same pattern and both marvels of compactness. They are of the folding kind, 4 x 5 in size, and fit in a small leather case, in which there is also room for two or three plate-holders. This case can conveniently be attached to the frame of the "machine," just behind the tool case, where it is out of the way and does not interfere with the legs. It is also provided with straps, so it can be carried on the back if preferable. These cameras retail at a reasonable price. They are not cheap, but they are well made and serviceable.

It is not my purpose, however, to call attention to the cameras only, but to dilate upon the advantages which they offer to amateur photographers who own a wheel. By means of the bicycle the amateur is enabled to reach scenery which is inaccessible to the ordinary traveller, and to take photographs of beautiful landscapes that are out of the reach of the average amateur photographer. The greatest gems may be found out of the beaten track.

Mayhap our photo-cyclist is an industrious clerk who shoves a quill all day long in a dingy city office during the week. But Sunday finds him on the road before sunrise. He reaches his destination in the coolness of the morning, spends the day in angling, photographing the pretty girls and perpetuating beautiful landscapes, and returns home in the evening when the sun is no longer terrible. On reaching his room he takes a cold sponge bath and then enjoys a sound sleep, and the morning finds him back at the office in the pink of condition, while the other clerks look jaded and worn. During the following evenings he develops the plates he took on the Sabbath, revives the beautiful sights he saw, and recalls the experiences he had, and thus lives over again the day he spent so happily. And when winter comes, he has a batch of interesting photographs to show for his summer's work.

I believe the average amateur lacks incentive. He wants some stimulant to make him work and to call forth his best efforts. And I believe that a bicycle will furnish this incentive. It will take him to scenes that he will itch to photograph, if he takes the slightest interest in the art-science.

I disbelieve in the common practice of fastening the camera on to the handle-bars, of focus-



"I HAVE A LITTLE CAT AND I'M VERY PROUD OF THAT"
BY E. LEE FERGUSON

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ing, and then steadying the bicycle with one hand while an exposure is made. That will do well enough for snap shots, but it will not do at all for time-exposures. It is a much better plan to carry a compact tripod strapped to the handle-bars, and to use that when necessary.

RELATION OF PHOTOGRAPHY TO DESIGNING. BY PRUELLA JANET SHERMAN.

THIS is an age of illustrating. All the world is a picture, and even an advertisement without such a representation is like a rose without fragrance, and fails to attract. The artistic sense is becoming a national attribute and demands gratification, and designers are taxed to their utmost abilities.

No artist does truer work than he who paints from nature. Nothing in the realm of nature is



E. DONALD ROBERTS, JR.

capable of such a variety of expression and attitude as the human face and form. But the pencil is slow, and not always accurate. Meantime the designer capable of handling the camera steps in, and, with an adjustment of the lens and a quick exposure, has the picture while the sketching artist is selecting his pencil. Every point is perfect; there has been no vexation to weary the model; no opportunity for the fading of lights nor the changing of attitude.

No one seems to appreciate the truth of this more than E. Donald Roberts, Jr., whose work



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ANITA BY E. DONALD ROBERTS, JR.

is evidence of most gratifying possibilities. Mr. Roberts is a designer whose artistic sense is highly developed. His theory has always been to catch nature at her best, and adapt the reproduction to the best possible use.

To reproduce such a picture in black and white, or in colors, is to find its commercial value. Thousands of dollars are spent annually for illustrative advertising. When one enters any place of business he cannot fail to observe the lavish profusion of artistic work scattered everywhere in the shape of advertising. Nor does it stop here. The numerous posters which adorn our bill-boards, the highly-colored cards which delight the children, even the labels on

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NEMESIS

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A DAUGHTER OF THE NILE. BY E. DONALD ROBERTS, JR.

canned goods at the grocers, all call for more or less originality. There is no manufacturing plant, insurance company, or business house of any kind that can afford to neglect the artistic side of advertising. While, as for railroad companies, they might as well attempt to veil the beauties of the landscape along their routes as to ignore the benefits of artistic design as an advertisement.

Hence the demand for original, striking and appropriate designs. Men's brains are sorely tried and life is short, but this is also an age of progression, and mechanism must be made to lighten labor and at the same time to secure accuracy. Therefore, the successful combination of photography with designing, to observe closely, is to comprehend the intimate relation that exists between the two when the skill of the true artist directs the composition of the picture. It is the improved method of reproduction, keeping pace with the demand for originality in design.

The possibilities of the camera in this direction are almost illimitable, both as to production and economy of time. An idea which a sketch artist might require several days to compose may be as satisfactorily produced in as many hours by the use of the lens. While the sketch would only furnish the idea, the camera would have caught every detail in all its completeness. But the operator must have the ability to perfect the composition of the picture with actual material, and be capable of calling forth both pose and expression. Unfortunately the number who have entered this field with success is small. There are but few who have the ability to satisfactorily combine photographic skill with originality of design.

Mr. Roberts has sketched ever since he was old enough to hold a pencil. He took up the camera about three years ago, with a determination to test its value in connection with designing, for commercial purposes, and has been exceedingly successful. He is a man capable of making the most of the material at hand, and his home overflows with evidence of the possibilities latent in a single model when controlled by artistic ability. He has also a keen appreciation of the adaptability of a design to that which it represents, and is quite capable of producing expression—if such a phrase may be allowed—at will; competent to put his model in the frame of mind and attitude of body which will tell the story his picture is meant to convey.

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THE SERENADE

"'Neath her window a soft sweet strain
and love's old thoughts come back again"

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A DAUGHTER OF VANITY — BY E. DONALD ROBERTS, JR.

One of the most attractive compositions is an oriental study entitled, "Mother's Happy Hour with Baby." The mother, richly clad in the habiliments of the East, has placed baby in the tub, and, half reclining on a tiger skin, lifts the water with her taper fingers and drops it, clear and glistening, over baby's head. The apparent utter unconsciousness of the woman as to affected pose, and the real delight of the child, is perfect. There is no suggestion that these two do not suppose themselves alone; no thought put forward that they are sitting for a picture. This composition took first prize at the *Buffalo Express* competition last year. It would make a fine advertisement for a soap company.

A charming design is manifested in the picture entitled, "Whistling for More." The mother holds the baby in her lap, keeping the coveted treasure out of his reach while he tries his best to whistle so that he may be rewarded by sweets which are to him so tempting.

Another study of the same child represents "Blossoms," and is a veritable Cupid in his scant drapery of lace, and his delighted, baby smile

Another picture of delightful naturalness is the one Mr. Roberts calls, "It's I," and was taken with the model in her every-day attire; just caught on the impulse of the moment, with no attempt at "make up."

"Brighter Than My Jewels" is a young woman, exquisitely posed and draped, holding in her uplifted hand a wine glass. This would be very appropriate to represent a wine house or mineral spring company, and was ranked second at the *Buffalo Express* competition.

"The Serenade" is represented by a beautiful girl who has evidently paused while playing the mandolin, and, with absorbed, retrospective

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IN THE ORIENT

A MOTHER'S HAPPY HOURS WITH BABY

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HAGAR BY E. DONALD ROBERTS, JR.

expression in her face, listens to some sweet sound. This picture was suggested by the lines:

> "'Neath her window a soft, sweet strain:
> And love's old thoughts come back again."

This would make a fine advertisement for a music house.

"A Modern Sultana" represents a woman of the East in oriental costume, reclining on a luxurious couch in an attitude of semi-abandon, her head resting on her hand, her eyes looking forth dreamily. It is an exqisite composition, and has been reproduced by lithography in colors. In this form it has found great favor and a large sale as a stock-hanger in various establishments.

While the range of Mr. Roberts' subject is unlimited, many of his designs are of oriental conception and betray striking originality. Many heads in his collection are adaptable to various purposes where an attractive face is required, and it is here that the wonderful power of variety of expression is most forcibly shown. The same model, by change of pose and arrangement of light, is made to represent all types, from the delicate blonde with fair, fluffy hair, as suggested in the picture of "Recollections," to the dark and rich-hued "Daughter of the Nile." Again, the same face has been transformed into "Nemesis," stern and relentless, while from the eyes of "Hagar" looks forth the shadow of despair; that in "The Flower of the East" only represent girlish innocence and beauty. Thus are expressions caught by the camera which are superb in their naturalness. "Nemesis" was exhibited at the National salon in Washington, and purchased by the government for the National Museum, purely for its artistic value.

Notwithstanding these gratifying results, Mr. Roberts has been badly handicapped in his work by want of many necessities; all of his pictures being taken by the light of a single north window. His studio is a plain little room at home, with a sheet stretched on a screen-frame for a reflector. Neither has he been supplied with expensive apparatus, his camera being but an inexpensive one, and his lens only ordinary. Very little retouching is exercised in his work, nearly all changes being accomplished before the picture is taken. No part of the work goes out of his own hands. He makes all his own costumes, using a few yards of drapery over and over again, each time with new and graceful effect.

He has, however, been exceedingly fortunate in possessing a wife deeply in sympathy with

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his art, who has been of great value and assistance to him in his artistic career.

E. Donald Roberts, Jr., was born in Hartford, Conn., in 1866. His talents are doubtless inherited, as his mother was not only a painter, but a musician and writer. He lived in Hartford until he reached his twenty-second year, for two years having had a studio as designer. He then accepted a position with the Forbes Lithographing Company, of Boston, Mass., where he remained as designer for three years. At this time his health failed and he found that he must be more in the open air and engage in some less confining occupation. He, therefore, accepted a position to travel for a Philadelphia house. The nature of the business of this firm being similar to his previous work Mr. Roberts found his ability to design a great assistance.

While passing through Detroit, Mich., about five years ago Mr. Roberts received an offer from the Calvert Lithographing Company, which he accepted, and has remained with them ever since. For the past two years he has made practical use of the camera in connection with designing, and is an enthusiast on the subject.

Mr. Roberts is exceedingly ambitious, constantly working for perfection, and as zealously expecting to find it; is precise in his methods, and possesses the rare faculty of being both plain-spoken and agreeable in manner. He is wrapped up in the perfecting of his art and feels that the commercial value of photography as applied to designing is soon to be comprehended by all interested in artistic advertising.



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BLOSSOMS BY E. DONALD ROBERTS, JR

EXAMINATION OF CATHODE AND ROENTGEN X-RAYS THROUGH COLORED SCREENS WITH THE FLUOROSCOPE. BY JOHN CARBUTT.

1. The cathode rays in an excited Crookes' Tube viewed through a pale yellow screen, shows increased brightness of the yellow rays.

2. Viewed through a dark violet screen, the cathode rays present a phosphorescent glow, similar to that in a low volt lamp when held in the field of an induction coil.

3. Viewed through a green screen the cathode rays present to the eye a light emerald green.

4. Viewed through a dark red screen, the cathode rays present a pale red, on the carmine tint.

The screens are of thin polished plate glass 1½ m.m. thick, coated with gelatine, colored with aniline dyes such as I use in making my photochromic screens.

Examination of Roentgen rays through plain glass and the aforementioned screens, shows that both cut off or absorb fully 50 per cent. of the Roentgen rays from reaching the screen of the fluoroscope. Screens of the following colors were placed side by side with the clear glass, viz: dark violet, green, light yellow and dark red, and when in juxtaposition, it was impossible to recognize which was clear glass and which was colored, and the eye was unable to detect any color sensation when looking through the fluoroscope with the colored screens in close contact.

These experiments confirm me in the opinion I have held from my first dealing with the Roentgen X-rays, that they are of the ultra ultra-violet, because I find they absorb the

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entire spectrum, while a deep violet screen absorbs all but the red.

It was early determined by Prof. Roentgen that the X-rays could neither be deflected nor refracted, and I am not aware of any experiments having been made to determine the absorbtive powers by the X-rays of the colors of the spectrum.

A NEW RESORT. BY R. HENRY SCADIN.

Down here in the mountains of Western North Carolina is being started by a company of Northern capitalists a resort which, if nothing happens to upset their calculations, will, in a few years be noted. Beautiful mountain scenery and pretty waterfalls are to be found in every direction. Roads and bridle paths are being constructed to all points of interest, and people who enjoy walking and climbing rocks can find endless amusement at it about here, and your humble correspondent adorned with hob-nailed shoes, canvass leggings hunting jacket and a 5 x 7 camera, rambles through the forests, over the mountains, and, along the river courses, taking views for the



CULLASAGEE FALLS BY R. HENRY SCADIN



FERNLAND BY R. HENRY SCADIN

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company to advertise with when the proper time comes. Mount Toxaway (or Hog-back) is the principal one of just this section. Its elevation is something over 5,000 feet. The summit is large and flat enough to locate a good-sized town on, and the views in all directions are fine. On clear days the coast line of South Carolina can be seen. On the north of this mountain lies an unbroken forest of over 3,000 acres. Deer, bear, and even panthers are at home in its fastnesses. The game is protected. At one place on the property there is a natural basin, and a scheme is on foot to dam the stream which flows through it. If this is done a lake with a shore margin of 18 or 20 miles will be formed, and which will be deep enough to run a steamer on. Arms of this lake will reach up in picturesque canons, where, in places the rocks will tower up from the water to a height of 1,000 feet. At other points the shore will be a gradual slope, lined with the forest and its carpet of dark green ferns. It will be as lovely as anything in Switzerland and what a place for the lover of scenery! be he painter, poet, or photographer. Besides the landscape attractions, there are quaint people living in these mountains whose habits of life and methods of business are as strange to denizens of other sections, as are those of a foreign people. I hope to secure some photos characteristic of their home life when I get better acquainted, and if our kind editor should again invite me to contribute to "The Annual" next year, I may have something of that kind to offer.

In conclusion I would say that we are 27 miles from a railroad and a day's journey by rail and stage from the noted city of Asheville. The air here is pure, cool, and never sultry, and is a beneficial climate for overworked portrait photographers to resort to, and calm down their shattered nerves by inhaling ozone and eating (perhaps catching) *speckled trout*.

NEGLECTED OPPORTUNITIES.

BY FREDERIC FELIX.

EACH year such an improvement of photographic equipment is shown that one can almost think perfection in apparatus has been reached. It is possible to procure an instrument for any purpose imaginable, and make it do exact duty for almost every requirement of that end, or it is possible, by some variation of parts, to have the same outfit include the advantages and possibilities of several separate ones. Nearly every objectionable feature to popular photography that could be suggested has been overcome. At one time it was the size of the instrument necessary that prevented many from interesting themselves, but now excellent outfits can be carried in the pocket; the view camera was considered too inconvenient to depend on for general use, but the many folding patterns obviate that objection; the box, or detective camera, failed to suit many because of being incapable of anything but mechanically recording mere snap shots, but the folding styles, just mentioned, do away with any such regrets, as do other styles that combine rising and falling fronts and swing backs within the box inclosures, making them lack in no detail when compared with the much depended upon view patterns. Thus it is that photography is simplified and brought nearer the people every day, and is no longer so generally looked upon as such a mystery as of old, when inconvenient and expensive apparatus kept most people from thinking of the art in any way except to associate it with the head clamp and long poses of the galleries.

People of all positions and vocations are rapidly learning the fact that they can, without the necessity of superhuman faculties or efforts, make as good use of the wonderful pictorial science as the many artists whose work they have been admiring, and there is a constant, genuine effort on the part of a great number who take up the work to emulate the examples of worthy predecessors. But the great proportion that does not look to the artistic points need not be deplored, as it is not often that the finished, beautiful work of the one and the crude efforts of the other will be confounded, and proper credit not given to the deserving one. Merit will be appreciated wherever deserved, and the more, too, if there is an abundance of opportunity for comparison. Another reason why the increasing number of interested persons need be considered only for the good, is that their prevalence so largely assists in maintaining the supply houses and aids in the improvements that are constantly going on for the general good.

People who are awakening to the possibilities of the photography of to-day cannot fail to think of times when they could have put a camera to satisfactory use, and such thoughts prompt them to prepare against a repetition of such disappointments by asking an initiation at once into the knowledge of the art.

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How many times can be heard the expression, "I would have given anything for a camera just then." It is used by a fond parent who sees so many cunning things in his child too late to save anything more than a memory of them; by a physician, who remembers some peculiar case; by a traveler, who has come across something attractive in his wanderings; and, in fact, by people of almost every position and calling. Several examples of personal experience come to mind at this moment, and more could easily be thought of, where many a fine opportunity for a picture of value was lost. Of late years, since having instruments for various needs and being able to use them, there are no such disappointments, but, instead, numerous very satisfactory experiences have been had, and the prints are on hand to show for them.

When James G. Blaine was traveling over the country in a special car and train on his presidential campaign, an immense crowd gathered at the railway station to see and hear him. He left the car and delivered his address from a special stand. The people thronged around in all directions for a great distance, and the enthusiasm was such that almost every word the noted man uttered brought forth a cheer. He finished his speech and made his way back to the car. The train was ready to start. Mr. Blaine stood on the platform and began waving an adieu to the crowd. The train moved slowly and had gone a few feet when an old man from the country, who was pushing his way among the people, finally reached the track, and running after the car caught up to it and reached to Mr. Blaine a great golden apple. It was an exceptional specimen of fruit and must have been the beauty of the entire county. The great statesman took the simple gift and holding it in one hand with the other he waved adieus to the people as the train increased its speed and finally was lost to view down the track. I have always considered that an opportunity lost. Like many others, I would have given anything to have had a camera there at that moment to secure the look of pleasure on Mr. Blaine's face as he took the countryman's gift and thanked him for it. I know he appreciated that token of regard as much as if the citizens had taken him down to a banquet. The entire circumstance was a picture in itself.

A sportsman joined a party of north woods bear and deer hunters. He provided himself with the finest and truest rifle, an abundance of ammunition, a fancy blazing hatchet, the very best of everything in the way of clothing, and, in fact, left nothing, as he supposed, to be desired. But he did not take a camera along. In fact, at that time he knew little about cameras, but it was not long after his return, when thinking of what he had missed, that he acquired a photographic equipment and then longed for a repetition of the opportunities of preserving the exquisite poses of the great game he encountered in its natural haunts. He thought at the time he was losing what he could consider a great treasure by being powerless to save the scenes before him, but when he came into possession of the camera his disappointment at the loss increased tenfold. This hunter is applying himself assiduously, and intends to make a great effort, on his next trip, to bring back in his plate-holders some of the places and events that tend to raise the enthusiasm on beholding them.

One day when the late humorist, "Bill" Nye, and the "Hoosier Poet," James Whitcomb Riley, were traveling together as entertainers, they were passing along the street and came to a bulletin board covered with circus lithographs. Mr. Riley noticed a pair of giraffes in the collection, and stopping Mr. Nye in the middle of the street reached up, put one hand on Nye's shoulder and with the other pointed to the board, saying (I was close enough to hear), with a peculiar drawl, "How would you like to be one of those creatures?" Then both laughed as though it was the greatest piece of humor. I would like a photograph of that pair as they stood for the moment, and many times has the regret come that a camera was not at hand at the time. Of course, in a case of that kind it would have necessitated the use of something after the supposed detective style, but then one could be sure that, under any circumstances, such a couple of jovial characters could have no objection to such a proceeding, even had they known of it.

These examples are very inconsequent in comparison with many others that can be heard of from almost any source, but such things as much as anything else, prompt people to arm themselves against the possibilities of future disappointments of a similar nature.

"NATURE can only suggest what stimulates the poet to the conception of a whole; and the poet must have the capacity to be so stimulated."—*Joseph Skipsey, the Miner-Poet.*

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TYAG; OR, THE RENUNCIATION.

BY SHAPOOR N. BHEDWAR.

INTRODUCTION.

"The highest thing that art can do, is to set before you the true image of the presence of a noble human being." RUSKIN.

ART is nature humanized and the following pictures are calculated to spiritualize art by inspiring into our life nobler aims and purer aspirations. The inner workings of the mind of the Yogi-Raj and his would-be disciple are so portrayed as to leave no doubt as to the meaning of the story intended to be conveyed by these productions and help us to the elucidation of the mysterious problem of our future existence. Powerful as art may be in the accurate representation of visible nature, the highest triumph is secured when the deepest emotions of the heart and the innermost workings of the mind are vividly delineated. These



I.—WEARY SITS THE YOGI-RAJ

pictures convey to us, what a new aspirant to advancement and progress in his spiritual career is required to know and study. The would-be disciple is, first of all, taught the entire eradication of selfishness in all forms and the cultivation of broad and generous sympathy in an effort for the good of others; secondly, the absolute cultivation of the inner spiritual self by meditation; thirdly, the control of all carnal desires; and lastly, the careful performance of every duty belonging to one's action in life without desire for reward. By a faithful adherence to these laid-down rules the probationary



II.—ABIGAIL. THE SURPRISE

"chêla" does not fail to attract the attention of those who watch the entrance to the path, for that nobler order of the Yellow Robe standeth to this day, to help the world From the moment of acceptance, the "chêla" stands entirely on his own merits, the teacher not compelling him in any way nor giving him other assistance than to point out the path along which he must go. Every step of the long, uphill path has to be travelled by the self-conscious effort of the aspirant himself. The progress of a neophyte depends on his unselfish devotion to the truth under whatever aspect, on his desire for spiritual progress, on his love for humanity, and on the intensity of his motives. Unselfishness, self-sacrifice to the higher interests of others, gentleness, purity of body and mind, patience and fortitude, have all to be attained at an

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III.—ALL INTENT THE PALM HE READS

early stage in his progress, if success is to crown his efforts.

"When one
Abandoning desires which shake the mind
Finds in his soul full comfort for his soul
He hath attained the Yog!"

Thus the first seven pictures of this series are made typical of the seven births that a "chêla" in his progress of the attainment of his degrees takes, thus completing the first cycle on the path of spiritual progress; while the eighth is made symbolical of the end of the first stage of the progress of the disciple.

1st.—Weary sits the Yogi-Raj.

Here the Yogi is made to represent the highest embodiment of humanity in its fully evolved and perfected state of Yogism, which is akin to saintship, and who is supposed, "with fast and frequent watch and search intense of silent meditation," to have attained the highest object of treading the path divine. He is supposed to be a great initiate into the mysteries of life and soul and death, and who by deep devotion has come to acquire supreme purity and perfect control over self.

"Soul is self's friend when self doth rule over self.
But self turns enemy if soul's ownself hates self as not itself."

No impurity of thought ever touches him, no impurity of action ever stains him, for he must be pure in the threefold cord of duty, that threefold thread of thought, word, and action. Supernal truth, compassion, and fortitude are the virtues he has acquired by practice and steady meditation. By a deep study he has attained such a sense of prevision that merely by the force of his inner consciousness he comes to forsee the coming to the path of his would-be disciple and intuitively goes and sits near the the house of an Amir.

"For holy spirits feel all force divine
And know the sacred presence of the pure."

His daughter—"Amira, loveliest of all the dark-eyed daughters of the plain"—believed to be religiously inclined, is portrayed in the subsequent pictures as the heroine of the set.

2d.—Abigail—The Surprise.

The Amira is apprised of the visit of such a well-known Yogi-Raj through her abigail, who has by accident come across the path of the "Wandering Lord." The graceful maiden with her pitcher akimbo, bent on her morning mission of bringing water home, sees the venerable sage in a state of semi-trance wholly wrapt

"In keen unravelling of the Threads of thought
"And steadfast pacing of life's labyrinths,"

and is awakened by her soft foot-falls. He wakes up from his spiritual musings and the maiden is emboldened to approach him nearer.



IV.—THE MYSTIC SIGN

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3D.—ALL INTENT THE PALM HE READS.

The religious looking man looks up and the sylph-like maiden thinks of consulting him as to her future course of life by offering him to read the palm of her hand. The hoary sage being an expert at divination reads in the palm all intent, "the perils past, the crosses to ensue;" which impress her so much that she hies home to her mistress and informs her of the illustrious visitor being in her vicinity.

4TH.—THE MYSTIC SIGN.

The Amira, who is naturally inclined towards religious study and prone to mystic inspiration, yearns to meet this exalted personage and commands her maids to send for him. He is escorted into the house with all the distinction and dignity befitting his rank. Then craving leave the devotee expounded the philosophy of the Hindu Trinity. "Trirupa"—or Trinity as it is in every great religion, is the representation of the manifested God and that the Three are but a threefold manifestation of the One—The Universal A U M (God). He then explained at length how these three aspects of the One Unmanifested Existence can be known by their manifestation and visible expression in the universe. In this threefold Logos is seen the aspect of power, the aspect of wisdom, and the aspect of love. He then pointed out to his fair listeners the circlet formed by the little finger and the thumb of his right hand, which is symbolical of the limitless ocean of eternity, having no beginning and no end, which is to all an unfathomable mystery and represents the Great Unknowable.



V.—THE SOUL'S AWAKENING.



VI.—THE WORLD RENOUNCED

"Before beginning, and without an end,
As space eternal and as surety sure,
Is fixed a power divine which moves to good,
Only its laws endure.
The heart of it is love, the end of it
Is peace and consummation sweet. Obey!"

Here he repeated from the "Shastras"—"In order to become the knower of all self thou hast first of self to be the knower. To reach the knowledge of that self, thou hast to give up self to non-self, being to non-being. Seek refuge in thy soul, have there thy heaven." Such a masterly exposition of the Vedic philosophy, by the Master of the Yellow Robe, inspires the Amira so much that in a furore of religious yearning she resolves to embrace his doctrines and by following the footsteps of her master become his true disciple.

5TH.—THE SOUL'S AWAKENING.

In the excitation of her religious enthusiasm the Amira repairs to the temple of Shiva with her youthful companions. There she sees the

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VII.—THE PARTING.

"Guru" lost in self, his self into hisself, merged in that self from which he first did radiate—the spark lost in the fire, the drop within the ocean, the ever-present ray becomes the all and the eternal radiance.—Her soul was awakened.

6TH—THE WORLD RENOUNCED.

The Amira, whose soul is now fully alive to the arduous task set before herself of treading the Path Divine, resolves to persevere seriously in the pursuit of self-knowledge, and to struggle firmly with the personal, the transitory, the evanescent, and the perishable. Donning the yellow robe, on bended knees to the Voice of the "Guru," she listens.

> "Measure not with words
> The Immeasurable, nor sink the string of thought
> Into the Fathomless. Who asks doth err,
> Who answers, errs. Say naught!"

"O beginner! shun ignorance and likewise shun illusion. Avert thy face from world deceptions. Mistrust thy senses, they are false. Let thy soul lend its ear to every cry of pain like as the lotus bares its heart to drink the morning sun. Let not the fierce sun dry one tear of pain before thyself hast wiped it from the sufferer's eye. Those tears, O thou of heart most merciful, these are the streams that irrigate the fields of charity immortal. Be humble, if thou would'st attain to Wisdom. Be humbler still, when Wisdom thou hast mastered. Restrain by thy Divine thy lower self. Kill out desire, but if thou killest it take heed lest from the dead it should again rise. Aye, great is he, who is the slayer of desire. Still greater he, in whom the Self Divine has slain the very knowledge of desire."

> "Seeking nothing, he gains all;
> Foregoing self, the Universe grows 'I'"

"Have patience, candidate, as one who fears no failure, courts no success. Fix thy Soul's gaze upon the Star whose ray thou art, the flaming star that shines within, the lightless depths of ever Being, the boundless fields of the Unknown. Take then as much as merit hath in store for thee, O thou of patient heart. Be of good cheer and rest content with fate."

> "Veil after veil will lift—but there must be
> Veil upon veil behind."

7TH—THE PARTING.

Now arrives the time of parting from her lifelong co-mates and companions and a hard time of trial it is for all concerned. The comeliest of the abigails impresses on the cheek of her mistress a sisterly kiss, and with a hug and an embrace as cordial as it is sincere, the new



VIII.—ON THE TEMPLE STEPS

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aspirant to the spiritual Path is allowed to pass on out of the Temple, and the other handmaids are left to shed bitter tears of grief for their loss.

8TH.—ON THE TEMPLE STEPS.

Having complied with all the rules of spiritual progress in the foregoing seven pictures, the Disciple comes out of the Temple, and headed by the Yogi ascends the first portal on the stage of the second cycle of Spiritual Birth. It is thus by purging past wrongs and adding not thereto, complete in love and lovely charities that the Disciple attains Blissful Nirvana—sinless, stirless rest—that change which never changes.

EFFECTIVE APERTURE OF LENSES FOR NEAR OBJECTS. BY WM. A. KAREN.

A CONTRIBUTOR to *The Amateur Photographer* in an article entitled "Exposure," reprinted in the November number of the *Photographic Times*, makes the following observation in regard to the increased time of exposure necessary for objects situated near the camera as compared with objects more distant: "Nearer subjects require so much more exposure than longer distance ones, because the shadows are heavy, and there is so much more detail to be registered."

The reason here assigned is not the correct one, and as all the phenomena of photography are explainable by deductions from optical formulæ there should be no exception in this case. There is a much better reason for the increase in the time of exposure than the one quoted, and since it is an important factor in photographic optics it is worth our while to give the subject a few moments' consideration. When a lens is designated as having, with a certain diaphragm, an effective aperture of say *f*/8, it is meant that it has that aperture when it is focused for incident *parallel* rays, that is, when the ground glass with its sharply focused picture is situated in the principal focal plane for that lens. If, though, the ground glass be moved back so that objects near the camera may now be focused sharply, then the lens is no longer working at *f*/8, but at some aperture less than *f*/8, say *f*/10, and hence the quantity of light that reaches the plate is of less intensity than before, and a longer exposure is, as a matter of course, necessary to produce equivalent results. But why does the lens no longer work at *f*/8 when the ground glass is moved away from the lens? A lens works with greatest aperture, and hence with greatest delineating power, or the power of registering the greatest sum of detail, when it is adjusted for the principal focal plane, because there every point on the ground glass is illuminated by a pencil of rays of greater angle than is possible in any other plane more distant from the lens; because the diaphragm subtends a smaller angle from any point in the ground glass when it is racked back than when it stands in the principal focal plane where it is nearest the lens—pretty much in the same way that one can see more of the sky and be more illuminated by it when standing *near* a window than by retiring to the opposite wall.

In estimating the time of exposure that we are about to give to an object close to the camera we should remember that under such conditions we are not using the nominal aperture of the lens that is expressed in the diaphragm we insert in it, but only a part of it, simply because the diaphragm opening then subtends a smaller angle, and because the nominal aperture of a lens is based on the presumption that we are dealing with incident parallel rays.

Let us see how the thing looks in a diagram:

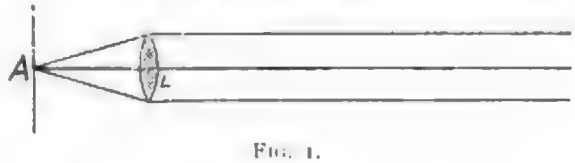


FIG. 1.

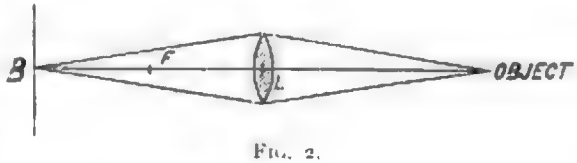


FIG. 2.

In Fig. 1 the ground glass is placed in the principal focal plane, and hence the incident rays that focus sharply are parallel rays; in Fig. 2 the ground glass is set back to twice the focal distance; it is then, of course, in adjustment for an object placed an equal distance in front of the lens, but it is also apparent that the angle at B, Fig. 2, is only one-half that at A, Fig. 1, and since illumination varies inversely as the square of the distance it follows that only one-fourth the quantity of light falls on every print in the plane at B as compared with A, and that in consequence the time of exposure must

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necessarily be multiplied by 4 to obtain the same light effects as at A.

For adjustments between these extremes it is clear that the time of exposure for near objects must be multiplied by the square of the quotient of the distance between the ground glass and diaphragm, divided by the principal focal distance, or by

$$\left(\frac{B\,L.}{F\,L}\right)^2.$$

If the camera bed has the principal focus marked on it one can readily estimate this quantity; say the situation is as follows:



If F L is the principal focal distance, and B L be the adjustment for some near object, then it is easily observable that $\frac{B\,L.}{F\,L}$, in this case, will be about 1½, and that the square of 1½ is equal to 2¼. Now then, multiply the time that you would have given to remote objects by 2¼ and you will have made a proper adjustment for the condition that the object is near. No account is taken here of other disturbing factors, as for instance, the element of haze due to distance which tends to annihilate all shadows.

TUNING FORKS PHOTOGRAPHICALLY APPLIED TO THE MEASUREMENT OF MINUTE INTERVALS OF TIME. BY ALBERT C. CREHORE AND GEORGE O. SQUIER.

An improved application of photography to the accurate measurement of minute intervals of time has recently been developed in carrying out some experiments upon the motion of projectiles inside the bore of a gun, at the United States Artillery School, Fort Monroe, Virginia. In these experiments, since the apparatus used permitted as many as seven observations being taken upon the projectile within the first 57 cms. of its travel in the bore, the problem involved the accurate and reliable measurement of time units which bear about the same relation to a second as a second does to a third of an hour. The ordinary method of obtaining a record of a vibrating tuning-fork photographically is to cause one prong of the fork to cast its shadow by means of a light beam condensed upon it, upon a narrow slit in a camera provided with a moving photographic plate close behind the slit.

The record obtained by this method is a strong shadow of the prong with a wavy edge due to the vibration of the prong. With a high fork and a comparatively slow motion of the photographic plate such as when the plate is allowed to fall past the camera-slit under the influence of gravity alone, the wavy edge from which the time measurements are taken has fairly pronounced maxima and minima permitting sufficiently accurate settings for ordinary purposes being made upon it by means of the reading microscope. But when the motion of the photographic plate past the exposed slit is great, this wavy edge becomes drawn out so that the error of setting is increased manyfold and prohibits the method.

The diagram Fig. 3 shows the principle of

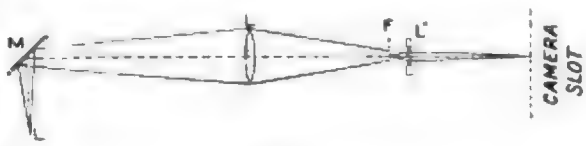


FIG. 3.

an improved method of obtaining fork records which give beautiful results and greatly increase the possible accuracy of such records.

One of J. B. Colt's projection arc lamps, *L*, was used as a source of light. A plane mirror, *M*, reflected the light through a condensing lens, *L'*, upon a thin piece of aluminium foil glued to one prong of the fork, *F*. In this fork was a smooth round hole about one millimeter in diameter. A lens, *L''*, focused this brightly illuminated hole as an object upon the sensitive plate, and at the same time magnified it to about six millimeters. The fork was excited by drawing a wedge from between the prongs in preference to using any electrical method, as this was found to be convenient and satisfactory.

When one prong of a fork is allowed to cast its shadow through a narrow slit upon a moving plate the result is that a single sinusoidal line divides the region of light from the shadow of the fork. At the same time the other edge of the fork gives another similar sinusoidal curve which is ordinarily separated from the first curve so as not to interfere. By having two slits near together one above another, a second shadow would fall on the plate having an exactly similar wave for its boundary, but it

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would lag behind the first wave by an amount depending upon the speed of the plate and the distance between the slits. This would therefore intersect the first wave at regular intervals of a wave length, and by the points of intersection make it possible to measure with great nicety the value of a wave length. Instead of having two slits the same object was attained by allowing the illuminated image of the magnified hole in the piece of aluminium attached to the fork to fall upon the plate. Those parts of the image which fell somewhat behind the rest gave waves differing in phase with the other part, so that results like those exhibited in Figs. 1 and 2 were obtained. It is noticed that

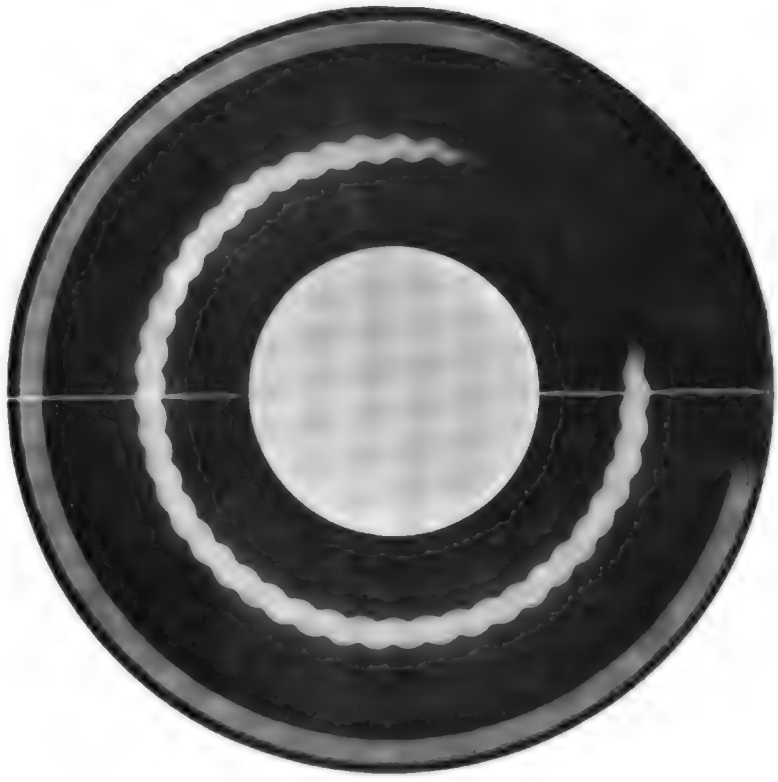


FIG. 2.—TUNING FORK. 1,024 (SINGLE) VIBRATIONS PER SECOND



FIG. 1.—TUNING-FORK. 512 (SINGLE) VIBRATIONS PER SECOND

a cone of darkness intersects a cone of light, the dark region having had no exposure, and the light cone, so to speak, a double exposure. The fine circular lines seen are shadows cast by ordinary hairs fastened across the slit. They serve merely as reference circles by which the centre of revolution may be accurately found. To allow the whole area of the magnified image of the illuminated hole to fall upon the plate, a square hole of suitable size was filed away from the jaws of the camera-slit opposite the point where the tuning-fork record was to fall.

Since all measurements were taken from the negatives themselves, which were suitably mounted upon an angle measuring in-

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LANDSCAPE BY H. TROTH

strument, the beauty and accuracy of the records should be judged from the negatives and not from the prints, since the latter fail to reproduce the delicate shadings and sharp intersections which permit the much increased accuracy of setting under the microscope.

These records are interesting from a purely physical point of view as a means of scientific research, and when it is understood how easily they may be obtained, it seems certain they must find a place in laboratory investigations where former methods left so much uncertainty as to the exact location of the maximum points of the waves.

ORTHOCHROMATIC PHOTOGRAPHY. BY MILTON B. PUNNETT.

ADMITTING that there are virtues in orthochromatic plates, then why have they not come into more general use?

The answer, I think, lies in the fact that these virtues do not become apparent unless a yellow screen is used, or the plates are very slow. One can readily see from the above that a maker of orthochromatic plates finds himself in the following dilemma: If he makes his plates slow so that they will retain their orthochromatic properties at a maximum, they will be too slow for general portrait work, and if he increases their speed, then they will partially lose their orthochromatic properties, and a yellow screen will be necessary, which will greatly increase the exposure and thus offset what he has gained.

But there is another method which seems to be quite overlooked lately. I refer to the "Bath Method." My means of a proper bath, such as published by Vogel, Obernetter, Ehrmann and others, orthochromatic properties can be given to any clear, rapid, fine grained plate. The orthochromatic effect is more pronounced with such a plate than with one dyed in the emulsion. Their greatest drawback is that they will not keep, only about eight days, but to the process worker who knows a day ahead what work he has to do, this should be no detriment. In the evening he could bathe the number of plates he wishes to use next day and dry them over night in a dust free, well ventilated room. Choose a plate free from fog and with not a comparatively yellow film.

That some makes of double-coated plates give very good orthochromatic effect with an increase in exposure is a fact that should receive more attention. Their keeping quality being equal, if not superior, to that of the ordinary single-coated plate is also greatly in their favor. Why they give orthochromatic effects is explained by the theory that those parts of the image formed in the upper coat by the so-called actinic rays, become partially reversed by the comparatively long exposure and thus begin to lose in density, while the non actinic rays have in the same time had a chance to build up their share of the image and thus overcoming the unequal effects of the light. The under coat prevents

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halation in the upper. It might be asked, why would not the effect produced by the actinic rays on the under coat counterbalance the effect produced by the reversal of the upper? The theory that a certain amount of light must certainly act on the silver salts in the film, before they are brought to in a state susceptible to the developing agent, and that the total amount of light which reached the under film in the given time is not sufficient to bring about this condition, I think explains the matter. If the exposure is very much prolonged, the under film is affected.

While on this subject I would like to refer to an article which appeared in the October number of many of the photographic journals. The results obtained by the author of the article in question are in a number of cases, contrary to the experience of others, and while the experiments may have been made and the article written with the best of intentions and honesty, the fact that three different brands of one maker's plates were used, and but one each of the others, also the "Use Dr. Pedler's Pills—Brown, Jones & Smith's are no good" spirit in which it is written detracts from its merits and creates a feeling of distrust of the results.

As the cuts to illustrate the article were furnished to the various journals one can conclude that the author either had the welfare of photographers very much at heart, or that there was "a greater power behind the throne." In conclusion I would advise the worker in his leisure time to try the different methods and plates with thoughtful care, and when he finds something better than he has been using, to adopt it in spite of somebody's theory or chart. If he has no leisure now-a-days, he's a lucky man.

"Prove all things; hold fast to that which is good."

SHARP FOCUS, AND OTHER MATTERS. BY A. HORSLEY HINTON.

In the small provincial town in which I live the comparative isolation from the larger centres of civilization constructs a narrow and circumscribing horizon within which the greater events outside interest but little and a somewhat narrow and less enlightened view of things in general exists, and I have observed how it is possible for a man to have his whole private character condemned in consequence of some single public act.

I presume, were I to walk abroad *one* day in masquerading costume, I should be put down as *always* mad, given to eccentric habits, no matter how exemplary my conduct for years previously or subsequently. Were I to meet a renowned ruffian and, in compliance to a civil request, gave him a light for his pipe and exchanged a single sentence of conversation whilst so doing, and were seen thus, I should at once be put down as a sympathetic friend of that ruffian and myself regarded as a rogue.

So in one's work. Were I to deliver twelve lectures for the benefit of some institution of recognized respectability, but gave number thirteen for, say, some socialistic order, I should be regarded as a staunch supporter of the latter and my twelve times greater support of the former would be forgotten and count for nothing. It is so with men in prominent positions in life; their many good deeds, the even and respectable tenor of their lives, count as nought if once by any single act they depart from the usual course approved of by the world.

By such rule, or misrule, have princes and powers fallen; and we live in times but little changed from those preceding the French Revolution or the dark times of the English Commonwealth, when to hold passing conversation with the hated parties was to become a "suspect." We are hardly more tolerant now than then of the man who, on some point of mutual importance, thinks differently to ourselves, and judge him as wholly bad or quite mad on account of a different view taken of things, perhaps overlooking the fact we both have the same end in view, and both attain it, but by a different course. But what of all this? Well, I find that many a time I have practised, and do so every day, all kinds of photography, and make photographs of every character, mostly of the kind which is called sharply focused. I do this either because the subject or the purpose for which the photograph is required demands that rendering of exquisite detail and faultless delineation of parts which is alone possible by good photography.

It falls to my lot oftentimes to employ other photographers, and again and again I have to refuse and condemn work because insufficiently clear, bright, sharp in detail, and so on, so important in many cases are these particular qualities. I like, and heartily admire, a photographic print which makes me marvel at its beautiful execution, at its vividness, and wonderful redundance of minute detail. Such deli-

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cate work seems to me very pretty and very interesting, and I think I should only feel satisfied when the work shows the utmost perfection of craftsmanship which I think the circumstances admitted of. I sometimes see in shop windows an exceptionally good example of technical work and purchase it, and subsequently strive to imitate its good qualities, and hardly ever visit a strange neighborhood or famous place without purchasing one of the popular "opaline" views, and certainly pick out the one which is sharpest and clearest, because such publishers as Frith, Poulton, Valentine, Chester Vaughan, and others employ skillful workmen for this kind of work, and I know I can rarely do this sort of thing better myself, and so a shilling or two saves me the trouble.

This exquisite mirror-like rendering of objects is a quality with which we have grown so accustomed, that we are apt to pass it by without sufficiently thinking of its worth, and how poor our forefathers were without it. Nothing can approach, still less compete with, photography in its magic-like rendering of every fibre and detail, its fascinating exactness, or in its rich translucence of surface, its finish, its fineness. It is a thing of marvellous beauty and a very pleasing display of skill, a thing most desirable for men to strive to do, and none more than myself feels inward pride and exultation when eagerly withdrawing the plate from its fixing bath, so impatient that scarce is the "fixing" complete, I find I have made a negative brilliant and clean, with every branch and grass stem clearly transparent in the nearly opaque surroundings—never a blur or indecision, no movement or indistinctness, bright, crisp, and satisfactory to the most exacting teacher of technique. Still more when from such plate the print is at last made, and every form and feature is so bright and distinct that finest pencilling could not come near such achievement, and each form and figure seems to stand forth as though nature were viewed through some wizard's glass. All this I say gives me immense pleasure, and when I see such work well done I am very glad, for of a truth really fine technical work is becoming rare.

Irreproachable technical photography is growing far more rare amongst amateur photographers because of a false notion that the most desirable thing to do so soon as one has mastered the elements of photographic practice is to make prints which at first glance have a passing resemblance to prints or pictures made by other means than photography. These amateur workers have somehow caught the idea that it is a good thing to counterfeit as closely as possible the work of brush or pencil, and the imitation in some cases being remarkably close it is assumed that the artistic value of the imitation is as great as the thing imitated in proportion as the one approaches indistinguishability from the other.

On this subject of imitation of styles and manner, I hope to say more anon, but for the present let me point out that whilst in some cases water-color very closely assimilates the appearance of oil painting, and the work may be highly esteemed as a work of art, yet we do not find it extolled purely because it is a juggler-like performance, artfully deceiving us into believing it to be what it is not. The production may be very admirable as a picture as carrying out the theme intended, and to do which the artist has thought fit to adopt a certain manner or style of working, but it is not the jugglery, the imitation of another medium, which constitutes or helps its claim to approbation.

Now I have in the foregoing uttered a strong expression of approval for fine, bright, technical work, and prefaced those expressions with a reflection upon the narrow-mindedness and intolerance of most people to-day, and my purpose is this:

I have made it a personal matter, I have put it as an expression of *my* approval, because I take it that there must be many, very many photographers who feel as I do in the matter. Out of some hundreds of plates successfully exposed, and prints satisfactorily made in the course of the year, probably 99 per cent. are of the character which would be termed *technically good*. For subjects, say they are such as a quaint building shortly to be demolished, or a country house visited of which I would preserve a memento, a friend whose likeness I would preserve (neither an Apollo in beauty nor possessing a head of leonine magnificence), and so in such cases I expose my plate and "do the rest," just as the Polytechnic student has been taught to do it, and strive to get a perfect photographic result, and I do this despite the fact that I know that there is to-day a prevailing fashion for putting things out of focus and taking things on dull, foggy days (or "fogging" the plate to produce the same effect). I say I do not care a fig for fashion, or what some say is right or wrong. I want a photograph of the country house

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which will show me every familiar feature, every blossom in the trim flower beds, each rosebud and leaf on the pretty trellis work, every stick and dot, so that I can look at it afterwards and have a whole page of memoranda which will remind me of my pleasant visit and the many happy incidents. Perhaps it is a view of some seaside place of sojourn, in which case I make or purchase a view in which I can point to a hundred objects, to some of which little stories attach themselves—there's the house I stayed in; that's my favorite seat on the Parade; there's the little shelter in which the old sailor stood and told me the yarns which I have since retold; there's where so and so occurred, and that's such and such a monument, and so on.

What is the good of saying, in consonance with the present fashion, that that is not good photography, it's just clever technique, and so forth? I say it *is* good photography, and remarkably useful photography, and a great deal better than many of us can do all at once, and whether it's just clever technical work and merely topographical, matters not. I want a photograph of that kind, and why shouldn't I have it? Perhaps I would rather spend half a crown on a clever technical topographical view than on any other kind of photographic production. It all depends.

Then says some one, "Oh, but it's easily done; only follow the instructions and use a good lens, etc." I don't think it is easily done, at least not easy to do it well. Of course, a certain amount of good technique is not very difficult to obtain, but when I say well done, I mean the moment of exposure well chosen, avoiding some figure looming hugely in the foreground, or moving figure grotesquely placed or inconveniently blotting out some object of importance; the point of view intelligently chosen, so that no railing or lamp-post thrust itself upon the view. I am really inclined to regard selection of point of view as belonging more to technical work than artistic; if the houses are in shadow they must still possess every detail, and if objects are in bright sunshine they must still not seem harshly white nor too solid, nor showing halation.

Take all the technical faults and excellencies into consideration, and I say a really fine technical photograph is any thing but an easy and still less a despicable thing, and when I want a view of a place, I, and thousands of folks like me, want a good technical print; and so let us at once recognize that there is a place, and an important place, for technical perfection, and let us deplore that so many good and able workers are running after a sort of craze, a sort of fashion which entails poor feeble work which aims at little and represents nothing, and calls it "artistic." It is the prostitution of some of the wonderful and distinguishing qualities of photography without any gain and without any apparent intention to good.

That there is such a prevailing fashion none can doubt. One sees it on all hands—beginners who have only practised photography for a few months, those who have been at it for years. It preponderates at exhibitions and in competitions, and one wonders whether it would not be well to treasure up the few brilliant exceptions lest in a year or so what we still call the good technical photograph will have become obsolete.

Well, I have said that thousands like myself do periodically desire and are prepared to buy a clear, bright view of place or scene, so let us hope the demand will still survive to create the supply. By constantly exercising those powers which the ingenuity and investigation of physicists, opticians, and mechanics have given us, we may in time accomplish by photography quite undreamt of things, even color itself; but at least, greater rapidity, greater depth of focus, that is, a more equal distribution of sharpest definition in all planes, the rare beauty of platinotype, gelatino-chloride, and bromide of silver upon fine supports, such as porcelain and ivory, are all qualities which, by constant use, may be capable of immense improvement. Greater transparency in water in landscape, greater luminosity in sunshine, and an avoidance of the necessity of printing-in clouds, and a thousand other points, are all matters which should be kept in mind and advances made as opportunity offers, but in all these directions progress can only be hoped for if we constantly exercise our powers. When our average productions are on a par with the few exceptions of last year, then our exceptional examples may advance a step higher.

There is too prevalent a dilettanteism, too great an inclination to be content when moderate excellence is attained. We want more care, more dexterity engendered by practice, and the use, when possible, of only the finest apparatus and best materials, and also a full recognition of the qualities which have hitherto distinguished photography throughout the world, namely, accuracy in the delineation of

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details, rapidity in recording and in faithfully copying, and the production of a very complete or finished work with a disproportionate expenditure of labor.

Then, says a friend to me, "But what about the work you yourself show at exhibitions, and the works of others which I have understood you to believe in, and which yet possess no great crystalline clearness or rendering of detail?"

Just so! With regard to my own exhibited work, that is, so to speak, the one hundredth after the production of the ninety-nine. I mean to say that after producing a great amount of sharply defined, glossy, bright photographs, which correctly represent the objects portrayed, I say to myself, "I'll just see if this same photographic machine and process cannot be made to produce something altogether different. I'll just try if, by leaving out some of the very qualities which I admire in a good photograph, I can produce something of a picture, that is, something which shall suggest the sort of feelings which the original scene suggested, something which shall remind me of, not the place and the objects, but the sunlight, the breeze, the clouds, the shadows, the brightness, or solemnity of the scene, as the case may be. Of course, it will be quite useless for purposes of identification. I may not be able to recognize objects or point to familiar spots. *I do not want to, it is not the purpose for which I shall produce this "picture."* It is a kind of application of photographic means to a special end which I do for my own pleasure, and out of which I have found it possible to evolve certain rules and principles. But it concerns no one else, unless, indeed, some one says, "How do you do this sort of thing?" and, "Why, what is the immediate purpose of sacrificing certain valuable characteristics of photography."

Then I reply—I say, for the sake of distinction, we will call "this sort of thing" *Pictorial Photography*, and I find such and such ideas lead me to it, and such and such methods help me to produce these results. I do not call it photography, or the best photography, and do not advise everyone to take it up; to me it is very interesting, it produces a more lasting pleasure; I find others, too, seem to value it beyond good technical photography, and what is more amusing is that, like the *one* eccentric act which at the commencement of this article I said might brand me as a hopeless maniac, so the few "pictorial" photographs I have produced have branded me in the eyes of many as a lost "fuzzy-ist" who produces pictorial work because he can do no other.

Written a good deal about it? Of course I have, because many seem desirous of traveling the same road, and I fancy I can help them, and above all things I would strive very hard to help others to distinguish between good technical photography and good "pictorial" photography, *nor call examples of the former by the latter term.*

There are certain qualities which are essential to a picture, painted, drawn, or otherwise produced, qualities which must also be possessed by the applied photography which we call "pictorial photography," and it is to set forth these qualities that I take it most writers, like myself, strive to do both in writing and in our works; but what I would like to insist on is that the man who *wants* to produce a sharp-all-over-glossy-surfaced representation of a scene has a perfect right to do so, and is as sane as the man who suppresses focus and uses rough-surfaced paper if this latter individual chooses so to do.

I say "*as sane*," not *more* sane. Moreover if I or anyone else chooses to produce what we are pleased to call pictorial photographs in the way we think fit, and you, my friends, don't like them, well, I cannot help it, nor should you become angry with me for not ceasing such practice. I may try and convince you that there is sanity and good taste in these productions, until *you* forget that it is but one phase of photographic practice, and one which has somehow found such popular favor that others *ask for guidance*, but if *you* don't like it leave it alone, and those who produce it.

What is known as pictorial photography has become so increasingly popular amongst amateur photographers who are free to pursue their photographing just in accordance with their own tastes that, in one's efforts to meet the taste of one's readers, one is in danger of forgetting the all-essential technicalities of practice. That pictorial photography is the popular side to-day can hardly be doubted, and all are more or less imitating or acting under the influence of others. Whether those others are Dr. Peter the Great, or Hon.Sec. George the First, matters not, they were among the first in latter-day times who in applying photography to pictorial ends suppressed focus and adopted such like conventional methods, and got a good laughing at by those who are willing to praise; and to-day when one uses the expression pictorial photography, it is at once assumed that it is

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a generic term, including those productions which the unconverted call or called "fuzzy," and the wrangle and warfare rages over the question as to how and by what particular scheme of treatment a photograph may be pictorial or artistic. It is not a question as to whether all photographic productions should be sharp or the reverse. The most pronounced exponent of out-of-focus would probably visit such an exhibition as that now open at the Grafton Gallery, and heartily admire the minute delicacy of the miniaturist's art. Art? Yes, art, and art which the photographer vainly apes and never rivals, though he need not distrust his ability to vie in the mere production of minute detail. Strange, is it not, that even with miniature painting, which abounds so in the exquisite delineation of fine detail, that still the photograper, apart from the question of color, seems only able to feebly imitate, or if not imitate, produce something which cannot for a moment compete?

Indeed, I am not sure that as yet the photographer who throws over recognized methods and produces something which, even if like, is yet a long way behind brush or crayon work, is much nearer the accomplishment of art than he who makes the sharply drawn miniature his model.

Why then do I talk about photography as an Art? I don't—I was almost saying I never have, but at least, I have not said so, or thought so, for a considerable time past, and have taken every opportunity of trying to make myself understood on that point. I am not at all sure that photography will ever be able to claim complete recognition as art or an artistic means, but I do feel that when men who have taste and judgment in artistic matters have taken to use photographic means, and have used them regardless of what some one else says is the right or wrong way, they have ever and again produced certain effects—certain painter-like arrangements, which are eminently suggestive and often quite satisfactory pictorially, so that one feels that here is a phase of *applied* photography which is very interesting, very charming, and certainly worth cultivating, even to the extent of holding a separate and distinct exhibition, thereby concentrating attention upon this one peculiar and especial phase; and partly because of the singleness of object, and partly because the enthusiastic and most prolific and oldest practitioners of this particular branch contribute to that separated exhibition I have considered it the best and *most representative of its class*, but do not suppose for a moment that *for all the pictorial photographs in the world I am going to neglect or cease to practice* AT OTHER TIMES AND FOR OTHER PURPOSES what I may call *normal* photography.

Now, for the good of photography generally, and for myself in particular, I shall as often as possible point out the difference between the two kinds. It is essential that such difference should be pointed out. For why? Suppose I produce a sketchy little effect by means of dodging a negative, or printing from the wrong side, or any such unorthodox method, just because I had a fancy so to do, and someone seeing it, says, "Look here! This fellow calls himself a photographer!"—or, another time I produce for some special purpose a fine technical photograph, and someone, not knowing the difference, exclaims, "This is the work of a man who is an apostle of suppression of focus for pictorial effect. I do not see much difference in this. If this is pictorial photography, I think I can do this!"—is it not important that the difference should be pointed out; *the difference of motive which has led to difference in treatment*, and then keep the two as far apart as possible?

I do not think that sharply rendered detail is conducive to pleasing pictorial effect. It is as though there were too much Nature in it, and Nature and Art, I need not say, are anything but the same; indeed, I am not sure that it would not be truer to say Nature is the antithesis of Art, though it will perhaps be time enough for the photographer to discuss that question in the next century. For the present it is enough to recognize that the mere copying of Nature is not Art, and it is probably the ready copying power of photography which has retarded its progress in artistic directions.

It is all very well to say that photography is so wondrously able to render atmosphere and haze, etc., but I am not sure that the mere correct portrayal of atmosphere or haze is any better than the mere portrayal of trees and flowers; they must after all be equally included in the list of physical facts, parts of Nature which of themselves and for themselves are valueless from the artist's point of view. If, however, such objects of Nature as mist and haze, and the indecision lent by the enveloping atmosphere, better enable us to produce a pleasing impression by our picture, then of

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course we take advantage of these conditions legitimately.

I like to think of the artist as a man who wants to produce a pleasing design or figure, who wants to describe with pencil or other tool a form which, when looked upon, shall give delight, just as subtly blended curves and undulating lines may, and so he finds the primitive human figure most suited to his purpose.

Thence developing his means of expression, gradually he finds other objects in nature are when outlined, pleasing; next come form and masses, and then color, and now when the artist would give us a picture which shall please, he draws upon nature to supply the forms and figures and combinations of colors and tones.

Romantic? Well, no, perhaps an idle fancy, but somehow I feel that if I move a piece of opaque paper backwards and forwards in a curve over a piece of sensitized paper, and so produce a sort of finely graduated curve of shadow, which would simply give the eye pleasure as a delicate tint and a curved figure, I am not sure that it would not be more truly artistic than anything ever produced by camera, lens, or plate; but this is a more abstruse aspect of art in relation to photography, and in a mere chatter, such as the present, I do not propose to sift it. Suffice it for the present to say that the pictorial application of photography is, as far as I personally am concerned, a mere side application, interesting in itself, and still more interesting in its suggested possibilities; but to run away with the idea that photography having on occasion accomplished a very close resemblance to the painter's art is therefore to be recognized as art is absolute folly. And if I say frankly what I feel respecting the recent exhibition in London, which confines its attention to pictorial work, and of which I can speak in high praise, *as a whole*, I should say that it probably did not include more than three works which were wholly satisfactory as works of art, as artistic achievements, not pictorial photographs, because whilst hitherto we have been rather too loosely using the term pictorial as synonymous with art, I perceive the growing need of differentiating between picture-making and art. For my own part, although an indifferent draughtsman or painter, I believe had I attempted to paint or draw what I have elected to produce by photography there would have been more art in the result if less general pictorial satisfaction.

Mad? Pardon me, sirs, I am not mad, but as sane and almost as alive to the requirements of an intelligent public as the late Sir Augustus Harris, but with just some desire to convert others to my way of thinking; but as regards the, to some folks, vital question of focus, I am very much attached to *f*/32 and *f*/45, and the stops are becoming quite shiny from frequent use, but looking at it from a very sordid point of view the out-of-focus things fetch the largest prices. I do not find anyone who will give three or four guineas for a 15 by 12 sharply-focused view, printed on gelatine paper, but there are many, very many, who will purchase at that price a 15 by 12 photograph, pictorially treated and with hardly one feature which can be called typical of good photography. But that's only one way of looking at it.—*The* (*London*) *Amateur Photographer*.

* * * * *

"The young student should in the first place acquire a knowledge of perspective to enable him to give every object its proper dimensions, after which it is requisite that he be under the care of an able master. . . . Next he must study nature in order to confirm and fix in his mind the reason of those precepts which he has learnt."—*Leonardo da Vinci*.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER III.

(*Continued from page 552*)

Phenomena of Sight, and Art Principles Deduced Therefrom.

It will be well now to inquire on scientific grounds what the normal human eye really does see; for our argument is, that a living being does not see things as does the photographer's lens. That the impression will vary with individuals, there is no doubt, for the artist will see subtleties never dreamed of by the commonplace or uneducated eye, and his aim will, of course, be to portray those subtleties in his picture, and hence one source of individuality in a work, another being in the way in which it is done, and a third the inherent difference between artists. Our task now shall be to examine into the physical, physiological and psychological properties of sight, and to arrive at a conclusion, in so far as science allows us, as to how the normal eye does see things. The student

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will do well to read Chapter II. of Book III. of Dr. Michael Foster's "Text Book of Physiology," as well as the matter on the eye in Ganot's Physics, before going any further in this chapter, for we do not wish to go over ground which has been occupied previously, our aim being to give a view from the artistic standpoint of the physical, physiological, and psychological properties of eyesight. We will, then, proceed to consider how well we see external nature, that is, within what limits, for we never see her exactly as she is, as we shall show.

To begin with, then, the retinal nerves are strictly reserved to respond to the vibrations of ether—called light. If the student has ever had a blow on his eye, he has probably *seen* "stars," because every stimulus to this pair of nerves makes us see things, and not feel them. Now each sense has certain limits between which it can detect subtle vibrations, but beyond which all is blank. The more refined the organization of the person, the greater will be the number of vibrations he can distinguish. Thus 399,000,000,000 vibrations in a second produce in us the sensation of light; above this the vibrations appear as spectral colors until the number 831,000,000,000,000 is reached; to an increase in the number of vibrations above that number the optic nerve does not respond. Now the eye is an optical apparatus fixed between the brain and the ether, not that we may perceive light, for we could do that without the eye but that we may distinguish objects. The glyptic and pictorial arts are based on the sensation of light, on the sense of sight as music is founded on the sense of hearing. In the pictorial arts, then, we must clearly distinguish between the physical, physiological, and psychological properties of sight.

A. Light.

I. Physical characters of the eye as an optical instrument.

If a ray of light passes through a small hole into a darkened room (pin-hole camera), an image is formed of the object or objects without. The condition of a good definition of the image is that "all the rays from each point on the object must be carried to its own point on the image." If this hole be enlarged, this condition is impossible, and the light spreads over certain areas called diffusion areas or diffusion circles. In other words, widely divergent rays and contiguous rays become mixed. To admit more light a lens is used in the eye, and by the photographer, for although it is possible (by pin-hole camera) to take pictures without a lens, the light so admitted is necessarily so limited that the exposure needed is too long. The lens, however, helps us by admitting more light, and at the same time giving better definition, but it also introduces many disadvantages and renders things as we do not see them. Now a *theoretically* perfect physical image has been described by physicists as being both bright and sharp in definition, but the theoretically perfect image does not exist; for, apart from other considerations, the lens which we use to get microscopic sharpness amongst other things, cuts off light, and the sharper the image is rendered by stops, the less relief do we get.

In the human and photographic lenses the chief theoretical faults are:—

Dispersion. All refraction or bending of light by a lens is accompanied by dispersion. This error is corrected in opticians' lenses to a great extent. It is slight blurring of the sharpness of outline, since the size and position of the optical images thrown by the differently bent rays is not the same.

A lens having a spherical surface bends the rays so that they do not all come to a focus at the same point. What is the effect of this on our theoretically perfect image? Again it is slight blurring of the sharpness of outline. It is said the spherical aberration in a perfectly corrected optician's lens *is less than that in the lens of the human eye*. From this it is highly probable that the chromatic aberration is less in the perfectly corrected lens than in the eye. This must be remembered in connection with our later remarks. In the lower animals, spherical aberration is nearly absent. Their vision therefore is more periscopic, and therefore more like that of an optician's lens.

This defect can be avoided in the optician's lens, but it exists in, and is a serious fault of, the human eye. It is, however, found in many opticians' lenses, and is one cause of false tonality.

Helmholtz considers the amount of spherical aberration unimportant as compared with this defect. Astigmatism is the result of imperfect centering of the cornea and lens. This defect is found in most human eyes.

Astigmatism prevents the eye seeing vertical and horizonal lines at the same distance perfectly clearly at once. The defect in centering

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also causes irregular radiation, so that, as Helmholtz says, "The images of an illuminated point as the human eye brings them to focus, are inaccurate." What is the effect of those defects on the "perfect image"? Dimness of outline and detail in the textures of objects seen.

The optician's lens is made of pure glass, the media of the human eye are not clear, but slightly turbid, so that Helmholtz says, "The obscurity of dark objects when seen near very bright ones depends essentially on this defect.

This defect is most apparent in the blue and violet rays of the solar spectrum; for then comes in the phenomena of fluorescence to increase it." By fluorescence is meant the property which certain minutely divided substances possess of becoming faintly luminous, so long as they receive violet and blue light. The bottles filled with solution containing quinine, which look blue in the chemists' windows, owe their color to this fact, as also does the blueness of "London" milk. These defects, combined with entoptic impurities which are constantly floating about in the humours, all help to detract from the brightness and sharpness of the "perfect image."

This is a portion of the retinal field with no cones or rods, and therefore insensitive to light. This causes a gap in the field of vision. "This blind spot is so large that it might prevent our seeing eleven full moons if placed side by side, or a man's face at a distance of only six or seven feet," says Helmholtz. In addition to this, there are lesser gaps in the retinal field, due to the cutting off of light by the shadows thrown by the blood vessels. Any one who has examined the retinal field with an ophthalmoscope knows what this means.

In addition to this the *macula lutea* is less sensitive to weak light than other parts of the retina. The effect of all these imperfections is to blur and dull the perfect image. The serious defects due to the blind spot are not noticed, according to Helmholtz, because "we are continually moving the eye, and also that the imperfections *almost always affect those parts of the field to which we are not at the moment directing our attention.*" The italics are ours. Here, then, is another great difference between the eye and the optician's lens.

The focus of the eye in a passive state is adjusted to the most distant objects. It focuses for nearer objects by contracting the ciliary muscle which pulls tight the zonule of Zinn and so curves the crystalline lens. It can focus thus up to within six inches of itself, but the changes of focus are almost imperceptible to the eye beyond twenty feet. Now a *theoretically* perfect eye might form perfect images of objects at infinite distances when there were no intervening objects. But as has already been shown, the eye is theoretically imperfect, and its images are not therefore perfect, and it could not form theoretically perfect images, even if the atmosphere were pure ether and nothing else, for there are other facts in nature which prevent this; thus we cannot see a sharp image of the sun with the naked eye on account of its dazzling brightness.

This central spot is a most important factor in the study of sight and art. For though the field of vision of the two eyes is more than 180 deg. laterally, and 120 deg. vertically, yet the field of distinct vision is but a fraction of this field, as we can all prove for ourselves. Now the field of distinct vision depends on the central spots for the reason that the central spot differs anatomically from the rest of the retina by the absence of certain layers which we need not specify here. The absence of these layers exposes the retinal bacillary layer to the direct action of light. Helmholtz says "all other parts of the retinal image beyond that which falls on the central spot are imperfectly seen," so that the image which we receive by the eye is like a picture minutely and elaborately finished in the centre, but only roughly sketched in at the borders. But although at each instant we only see a very small part of the field of vision accurately, *we see this in combination with what surrounds it, and enough of this outer and larger part of the field, to notice any striking object, and particularly any change that takes place in it.*" If the objects are small, they cannot be discerned with the rest of the retina, thus, to see a lark in the sky, Helmholtz says it must be focused on the central spot. Finally he says, "To *look* at anything means to place the eye in such a position that the image of the object falls on the small region of perfectly clear vision. This we may call *direct* vision, applying the term *indirect* to that exercised with the lateral parts of retina, indeed with all except the central spot." Again, he says, "Whatever we want to see we look at and see it accurately; what we do not look at, we do not as a rule care for at the moment, and so do not notice how imperfectly we see it." Taking the distance between the two central spots at 3 inches it follows from

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MARSHY MEADOWS BY H. TROTH

proportion that we must have an object six inches to see it; this, then, suggests the limits of the angle of view we may include from our point of sight. Now all this is most important in connection with art, as we shall show later; we must beg the student therefore to hold it fast.

(*To be Continued.*)

DIGRESSIONS. THE PICTURESQUE AND THE BEAUTIFUL. BY H. P. ROBINSON.

THE picturesque and the beautiful are the chief materials on which the pictorial photographer exercises his art. As "music is the food of love," the qualities about which I am to discourse are the food of the artist. The other artistic emotions (except the merry ones), such as sublimity and terror, are perhaps beyond the power of photographic expression. Possibly the time may come when our friend the scientist will supply us with a louder thunder and a more vivid lightning; we will then endeavor to wield them with pleasure, and who knows? we may reach the sublime. It is to be hoped that the lower qualities, from which the exaggerated impressionist used to draw his inspiration—such as it was—the ugly and the sordid, the music hall and the coster, will cease to exist as a subject for art treatment.

At the end of the last century and the beginning of the wonderful one we are now bringing to a conclusion, the relation of the picturesque to the beautiful was a favorite subject with authors who belabored each other with much amiable ferocity. Witness Alison on *Taste;* Burke, on the *Sublime and Beautiful;* Knight's *Analytical Inquiry into the Principles of Taste;* Repton's *Letters;* Price on the *Picturesque;* Gilpin's *Essay on Picturesque Beauty;* and many others. These books, some of them portly volumes, referred principally to landscape gardening, but, to get at where to plant a bush it seemed to be necessary to review all art from

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the beginning, and, in designing the plan and elevation of a shed, it appeared desirable to discuss the Great Wall of China, the pyramids of Egypt, the colonnades of Palmyra, and the aqueducts of Rome; therefore we have in this field of literature a good deal of "fine confused reading" which I shall probably make use of as I go on. I may, perhaps, as well mention that Downton Woods andthe Hay Mill, near Ludlow, known to many photographers, are the result of the experiments and planting of John Payne Knight, the author of the *Inquiry*, who owned the castle and estate about a century ago.

It is possible there are some who are not able to recognize much difference between the picturesque and the beautiful, and others compromise the matter by talking of the picturesque beauty of a scene. There are few words whose meaning has been less accurately determined than the word "picturesque," and, in the language of America (which is derived from the English), I am not sure that it exists at all, certainly not with the same spelling. But there can be no doubt that picturesqueness is a very real and distinct quality.

The word was originally applied to every kind of scenery or object which had been, or might be, represented with good effect in a picture; but it has long since acquired a more extended meaning. Thus we have picturesque language, and many things we now call by the name which are quiet unpaintable.

The picturesque has a character not less separate and distinct than either the sublime or the beautiful. The difference between the three qualities may be broadly described as—the picturesque, rough, or rugged, or irregular; the beautiful, graceful; the sublime partakes more of grandeur and awe, but may be dismissed from present consideration as not being within the limits of our art

The words "picturesque" and "beautiful" would cover the greatest and best qualities a photographer could desire to get into his pictures, and to have a clear idea in the mind of what these qualities are and their causes would be a great help to their attainment. We will now, therefore, attempt to throw together a few ideas of what picturesqueness really is.

Roughness, or ruggedness, joined to irregularity, are the most efficient causes of the picturesque.

This will appear clear if we take a view of those objects, natural or artificial, that are allowed to possess the quality, and compare them with those which are allowed to be beautiful.

For instance, there has just passed down the road a family of hoppers: it is raining steadily with the persistence of an autumn that follows a rainless spring and summer. The miserable father and mother and wretched children are a sad sight. Nothing could be further from the beautiful, but they are very picturesque. As a contrast, a charming young lady, adorned for her first important ball, may be beautiful, but, even if not charming, she could not be picturesque, although she may be very paintable, or make a delightful photograph. It must not be understood, however, that misery, as in the case of the hoppers, was necessary to picturesqueness. The most picturesque model I ever had was certainly the most jolly.

Now for an example from landscape architecture. A temple of Grecian design in its perfect state, either in painting or reality, may be beautiful; in ruin it is picturesque. Time usually converts a beautiful object into a picturesque one. Whether stains, lichens, partial incrustations, mosses, break up uniformity of surface, give a degree of roughness and variety of tint; variations of weather crumble stone, and give a degree of ruggedness; the primness of beauty deserts the object, and gives place to the picturesque. A geometrically planned garden, with smooth turf, nice trimmed walks and shrubberies, may possibly be beautiful, but could never become picturesque until it was neglected, overgrown with wild plants and creepers, and ivy mantled the statues and fountains.

Symmetry and regularity accord with beauty, but are adverse to the picturesque, and among the causes of the superior picturesqueness of ruins, compared with entire buildings, the destruction of symmetry is by no means the least powerful.

The origin of most of the picturesqueness of the world, from the humble cottage up to the highest Alps, is decay. It is also the cause of much of the best poetry. The contemplation of death, and especially the approach of death, seems to be eminently adopted for producing that pleasing melancholy which is certainly poetical, and seems to have a charm for most people. Poets dwell more on the sadness of parting lovers than on their meeting; jocund day standing on the mountain-tops may be occasionally mentioned by the poet, but he touches the feelings with a more thrilling sensation

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when his theme is a sunset. Why people should prefer to be touched to "the sacred source of sympathetic tears" as the highest form of pleasure, rather than be

> "A happy soul, that all the way
> To heaven hath a summer day,"

is too tremendous a question for me to consider here, but there can be no doubt it is a fact. In our small way, nearly every exhibiting photographer found that out for himself a few years ago, or, unhappy thought, did he purloin the idea from his neighbor? and we were deluged with dying-days, mellow eyes, twilight musings, rising mists, and midsummer nights. One effect was that suitable quotations from the poets were driven to a premium.

Now, I have not a word to say against this melancholy movement, except that we have had too much of it, not of the true kind, but of the inferior imitation; indeed, I very heartily applaud it. Anything that tends toward poetry in a photograph is to be commended. The difficulty came in, as usual, with the uninspired imitators. They seldom went to nature to find poetry for themselves, or to absorb the feeling with their own souls; they went to find something like that subject of their neighbors, because they thought they could do it as well. That mine was full of nuggets, but it has panned out. We want another general subject now. Cannot we do something with mid-day or even afternoon? If one or two would do something beautiful that looked easy, there would surely be plenty of followers. Milton made as good poetry out of *L'Allegro* as *Il Penseroso*, though it has always troubled me that he gave foreign titles to these two delightfully English poems—an affectation that has never yet died out.

In photography it is so difficult to be original, so easy to "level up," or seem to do so. Not only in single pictures, but in whole exhibitions, imitation is rampant. As it is probably all for the good of photography, and may possibly, in the future ages, lead to something more original, I am, indeed, proud to see my own pet child, the Salon, imitated in every item of outward dress, the cut and fashion, even to the numbers hung and the arrangement of bays they are hung in, the body but, unfortunately, not the soul, by those who once did not wish it well, reminding us of Tennyson's playful little verses:

> "To and fro they went,
> Through my garden bower,
> And, muttering discontent,
> Cursed me and my flower.
>
> "Then it grew so tall
> It wore a crown of light,
> But thieves from o'er the wall
> Stole the seed by night.
>
> "Read my little fable;
> He that runs may read:
> Most can raise the flower now,
> For all have got the seed."

But I am running away from my subject in my usual reckless way. It is well I headed these poor essays "Digressions."

Beauty is the so much more enchanting and popular quality that the word "beautiful" is often wrongly applied as the highest commendation to whatever gives us pleasure or raises our admiration, be the cause what it will. The ordinary human being seldom uses the word "picturesque;" it is always beautiful, if, indeed, it is not jolly, heavenly stunning, or one of those slang terms that of late years have been added to the vocabulary of the worshipers of the beautiful.

The power of beauty has been the theme of the poets for ages. Beauty has a different effect on different people; the appearance of things depends very much on the mind of the beholder, as also does the effect. When Milton's Satan, first saw the beauty of Eve, he was struck "stupidly good." A good phrase, but the effect was but transient. With many people beauty consists of only "what is worn." Yesterday I met a daughter of Eve with a structure on her head made of swan's wings, set upright, with an outward leaning, a sort of imitation of King Arthur's helmet, on which "the dragon of the great pendragonship blazed." However preposterous this wonderful construction appeared to others, it is easy to conceive that she thought it beautiful. Fashion, even in the worship of the beautiful, changes, and we are almost compelled to acknowledge, with the poet—

> "There's no such thing as that we beauty call;
> It is mere cozenage all;
> For, though some long ago
> Liked certain colors mingled so-and-so,
> That does not tie one now from choosing new.
> If I a fancy take
> To black and blue,
> That fancy doth it beauty make."

—*The British Journal of Photography.*

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The success of our Annual is not only gratifying but decidedly encouraging. As we go to press the entire edition is almost completely exhausted. The comments upon its contents have been very flattering. It is, of course, a very difficult task to please everybody, but we have endeavored to so vary the contents that everyone will find something of interest or value to him, and while you, reader, may find one or two things in the book that are not to your taste, yet you must remember that they may possibly be very welcome to others.

* * * * *

With this issue we commence Vol. XXIX, and if you are not a subscriber to this magazine we would suggest the advisability of sending in your subscription at once so as to secure the complete volume. A form for the purpose will be found among the advertising pages. We intend to make the present volume far in advance of its predecessors.

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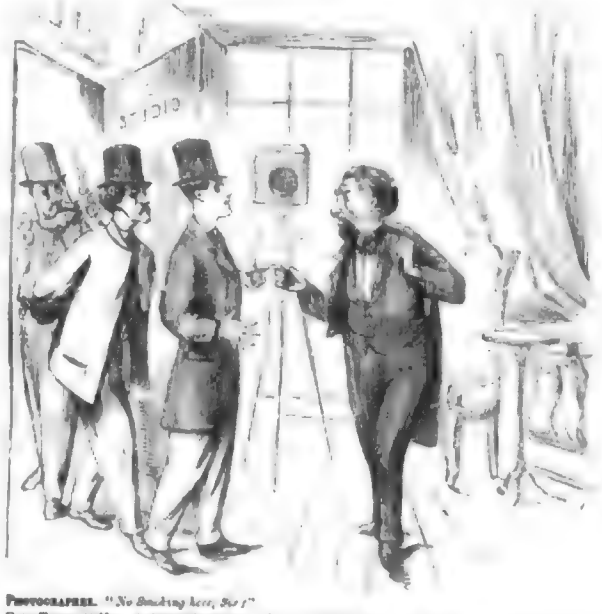
Mr. W. N. Jennings, a valued contributor to these pages, is at present in London, where he will remain for at least a year. He will associate himself with Mr. F. E. Ives in the management of the Photochromoscope Syndicate, Ltd. This is a syndicate formed for the purpose of manufacturing photochromoscopes, an invention already described in these columns.

* * * * *

Mr. Paul, the animatographer, tells rather an amusing story of how he secured his negatives for the animatograph pictures of the Czar's visit to Versailles, now being exhibited at the Alhambra Music Hall in London. Every effort was made to obtain permission, but the police would not listen to any proposal for the erection of the camera on the route. Mr. Paul accordingly hired a window for 500 francs, and employed a lady to stand in front of the camera so as to mask it until the critical moment. When the procession approached the lady stepped on one side and Mr. Paul rapidly took the series of photographs, to the horror of the *gendarme* who had brought him the refusal of the authorities, and who was wedged in the crowd on the opposite side of the street. As soon as the Czar had passed, Mr. Paul picked up his camera, dashed down stairs into the garden, where (we must believe) he buried the camera, and then got away from the house by back streets. The police came after him, but found nothing, and Mr. Paul was enabled to return at night, dig up his camera, and come to London with his impressions safe.

* * * * *

It is not generally known, perhaps, that the first drawing published in *Punch* by Du Maurier, the artist and author of "Trilby," illustrated a joke on the photographer. By the kindness of the editor of *Book News*, an interesting little magazine on books and bookmen published



Photographer. "*No Smoking here, Sir!*"
Dick Tinto. "*Oh! A thousand pardons! I was not aware that——*"
Photographer (interrupting, with dignified severity). "*Please to remember, Gentlemen, that this is not common Hartist's Studio!*"——[N.B. Dick and his friends, who are Common Artists, feel shut up by the aristocratic distinction, which had not yet occurred to them.]

From *Punch*, October 6, 1860.
Du Maurier's first drawing. The first figure is the artist himself and the second, Whistler.

by John Wanamaker, we are enabled to give a reproduction of this drawing.

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FRED COOP

Although quite a young man, as will be seen from the portrait herewith, Mr. Fred Coop is one of the few successful photographers in England to-day. In reponse to our request he has sent a number of beautiful specimens of his work. Reproductions of these will be found in this number. Mr. Coop sends us the following description of them:

"Above the Valley Mists," is a picture made possible only by the kindly fog or mist which reduced the hard distance into a softness, which I made an effort to picture, and I also fancy there is a downhill feeling about the foreground which is very difficult to obtain satisfactorily The ivy-covered church, barely decipherable in the distance, yet standing out stronger among the mistier surroundings, requires accentuation with the brush, which I am not afraid to use when I think proper, although some workers consider it very, very wrong.

"Come Along," is a picture made out of firstly, of course, the figures, some wild dead dog daisy from a garden at home, brought purposely, and hard, clear-cut houses and heaps of refuse; pailings for a background. In fact, the situation was a ledge of grass—with on the right the railway and on the left a free tip. And yet I venture to suggest that by subduing the ungainly distance and thus rendering it soft and not so severe to the eye, it has brought the principal object into greater prominence, and the picture as a whole, may have some pictorial value.

"A Bye Road at Evening." An endeavor to render a subject, in itself not finely balanced or well composed, which, after the sun had set some time seemed to fall into masses which were pleasing—the district being "Machynllesh, North Wales."

"Early Morn, Dovey Valley," was one of the results of rising at 4 o'clock in the morning and trudging by the River Dovey for several miles through the dewy grass in company only of my hand camera. The high light



COUNCIL HOUSE BIRMINGHAM
BY FRED COOP

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BEDFORD CHURCH BY FRED COOP



COME ALONG BY FRED COOP

is strengthened by the dark mass, contrasting with it, and at the same time centering the interest. The other results of this peregrination referred to were two wet feet and one bad cold. However, I was satisfied, and thought the game worth the candle.

"The Inner Harbor, Aberystwith." The pictorial qualities of this picture would have been greatly enhanced if the rope mooring the boat had been brought in shape back to near the right hand side of the picture. But this was impossible. The interest is well centered on the boat by the coincidence of light.

"Bedford Church." The town of Bedford was immortalized by Shakespeare. He called it Drunken Bedford, and not without cause, perhaps. People here at the age of 60 keep their grandparents. Having one day asked an old man how it was the people lived so long, he summed it up as follows: "Woi, sir, if yer eats 'ome made bread and drinks 'ome brewed beer, yer ken live as long as yer 'd a mind."

"Council House, Birmingham." This, I fancy, may be appreciated as representing the contour of the subject with some originality.

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ABOVE THE VALLEY MIST
BY FRED COOP

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A WELSH LANDSCAPE. BY FRED COOP.

The building in the foreground is portion of the new post-office, and the atmospheric effect caused me to take the opportunity of portraying this pictorially difficult subject.

"A Welsh Landscape." The lines and masses formed by the wall, road, and bank all satisfactorily lead the eye to the principal portion of the picture. This subject seen under different lighting appears very weak, and lacking altogether in artistic composition. I fear these remarks are rather disconnected and rambling, but you, my reader, will do the necessary filling up and destructive criticism. One word of advice or help: "I would advise you, if you strive after producing real, good pictures, to pay a great, yes, a very great, deal of attention to, first, lighting; second, atmosphere; and thirdly, good composition. Perfect composition is weak unless well lighted, but good lighting makes much out of little. Don't be afraid to subordinate, by focus or what not, anything and everything to the principal object."

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THE question as to whether a plate can be fixed in actinic light without detriment to the image is discussed by a writer in *Das Atelier des Photographen*. He refers to the results of his experiments as follows:

"If a plate, after development, is carefully washed with weak hydrochloric acid, and afterward in pure water, and is then cut in two, one half being left in the dark-room, while the other half is exposed to daylight, under water, a marked difference will be perceived when the two halves are placed in the fixing bath. The unexposed plate fixes much quicker than the other. The same thing happens if one half is fixed in the dark-room while the other is fixed in the light. In the end, however, both plates have much the same appearance, the one exposed to light often being a little denser. After washing, exposure to light will change neither of them. If the developer is thoroughly washed out, the exposure to light is perfectly harmless, provided that it is not of too long duration. The result is, however, different if the washing has been imperfect. A plate that was developed with rodinal, slightly washed, and exposed to light for a short time—insufficient for the developer left in the film to exercise any reducing action—behaved strangely in the fixing bath. In the first place the fixing process was much prolonged, then it did not appear to fix out completely and an intense yellow stain appeared. This yellow stain also appeared on bromide



THE INNER HARBOR AT ABERYSTWITH. BY FRED COOP.

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paper. Plates and paper treated in this way cannot be intensified with mercury. When placed in the mercury bath, even after hours of washing, the action is found to be uneven, and a terrible yellow stain is formed. These results were much less marked when iron was used as the developer."

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THE following amusing story of the late Sir John Millais is worth repeating:

One day while Millais was engaged in painting his famous picture, "Chill October," among the reeds and rushes on the banks of the Tay, near Perth, a voice came from over the hedge:

"Ma-an, did ye never try photography?"

"No, never," replied Millais, painting slowly.

A pause. "It's a hantle quicker," said the voice.

"Ye-es, I suppose so."

Another pause. The final thrust was: "An' it's mair liker the place."

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R. W. BUTTEMER, in *Photography*, gives the following instructions for making a fluorescent screen: Brush over a piece of black card with gum, and sift the salt over it. I have used this method with calcium tungstate (scheelite); but this salt, though brilliant, phosphoresces as well as fluoresces, thus giving a foggy image after a few consecutive trials. Or, mix the powdered salt with collodion (flexible, *i.e.*, containing a percentage of castor oil), and coat the card or aluminum foil with it. I have found this method most successful with barium platinocyanide on aluminum foil. Or coat the card or foil with dilute flexible collodion, and sift the salt over it. I have used this method with Melckebeke and Van Heurck's fluorescent salt, which appears to be an organic salt of uranium. But in all cases success depends on finely powdering and sifting the (carefully dried if necessary) salt. I use 120 to the inch.



EARLY MORN, DOVEY VALLEY BY FRED COOP



A BYE-ROAD AT EVENING BY FRED COOP

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WE have always advocated simplicity in development, and cannot resist a smile when we see a formula given like the following:

Boiling water	1000 parts
Sodium sulphite	120 parts
Hydroquinone	15 parts
Eikonogen	10 parts
Yellow prussiate of potash	20 parts
Carbonate of potash	75 parts
Caustic potash	15 parts
Bromide of potash	1 part
Glycerine	5 parts

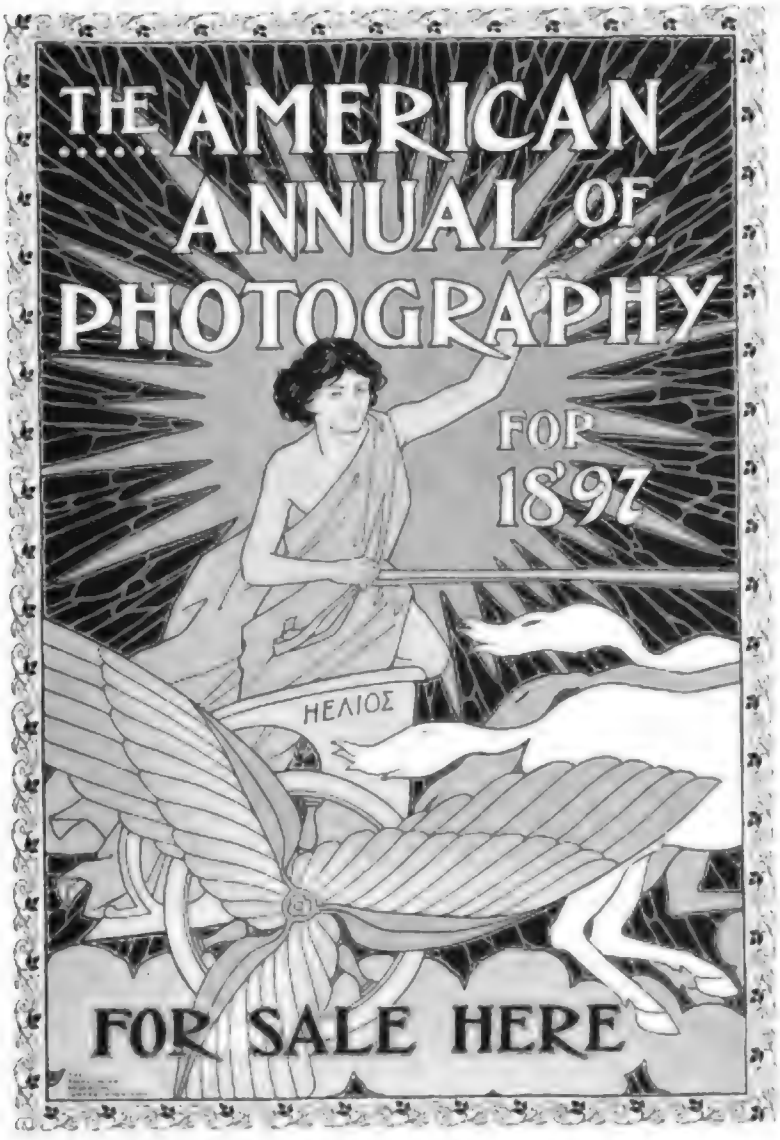
For use, dilute with half volume of water.

A Frenchman, Dr. Decaux, is responsible for it, and it is said to be a good all-round developer. No doubt it is. Possibly the worthy doctor has so arranged his formula that if some of the ingredients do not act satisfactorily the others will.

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"OUGHT not sound criticism to look to results only, and to disregard the means employed, and the precise amount of difficulty overcome in producing them? I think that a careful study of the work of painters, so far as composition is concerned, will show that pictorially the photographer may justly claim far more latitude in the choice of subject and the way of representing it than many fancy themselves entitled to, and a result of realizing this fact and acting upon it, would introduce a greater variety in the work produced by camera and lens—a result to be devoutly wished."—*Rev. T. Perkins*, in the *Amateur Photographer*.

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We have received many letters congratulating us upon the attractiveness of our poster. For the benefit of those who have not seen the design we give a reproduction herewith although, of course, we are unable to show the artistic coloring. The design is by a well-known artist, and the printing and engraving the work of The Photochrome Engraving Co. For the benefit of poster collectors we have reserved a small quantity, one of which we will forward to any address on receipt of 25 cents in stamps.

* * * * *

On another page will be found a number of reproductions from photographs made by Mr. Shapoor N. Bhedwar. Once again he draws his inspiration from the religious mysticism of his native country. A full description of the pictures will be found accompanying them, but we would particularly draw attention to the careful manner in which Mr. Bhedwar has handled the subject—to the composition and posing. It is by far the best thing that Mr. Bhedwar has done that we have seen.



BY J. DE BRUYN KOPS

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NAPOLEON SARONY



NAPOLEON SARONY

MANY thousand miles from New York we recently heard by cable of the death of Sarony, and the news came as a great shock to us, for it seems but a few weeks ago that we were chatting pleasantly to this king of photographers, and in our moods he will always be with us still. He was a valued contributor to this magazine. His last article on "The Private Character of Artist's Models" appeared in our "Annual" for '95, and in the current issue of the same work Mr. Gibson Willetts details an interview with him and describes his experiences with Sarah Bernhardt.

Writing in our contemporary, *The Photo American*, Mr. W. A. Cooper gives some interesting reminiscences of the great artist. He says:

"It was but Saturday we enjoyed his presence the entire afternoon, looking over many of his earlier creations—old, wet plates—with a running comment on his many and distinguished sitters. Their idiosyncracies and whims, and his final triumphs in posing them as he chose. I might say that only as late as October 1st I, with two other gentlemen, came into possession of all Mr. Sarony's negatives of celebrities from the first one made in 1866 up to the present, and the knowledge that all the old negatives were to be published and placed in the market interested him greatly; hence his frequent visits to our place. Only one week before his death—election day—he spent all day with me, and began a list from our sample books of the most desirable negatives; that is a very previous list now.

"The elevator was not running and he walked up the seven stories, singing as he always did to himself, as happy and as bright as could be, and in his absent-mindedness, something he was very prone to, he walked up another pair of stairs and landed out on the roof before he found his mistake. That was Tuesday; nearly every afternoon he came, and on Saturday, his last visit, he was particularly reminiscent and full of story and fun. A gentleman called to make an appointment for a sitting with a young violinist just arrived from Europe. Mr. Sarony appointed 11 o'clock, Monday, for the sitting, and enthused over the certainty of the result. I walked with him to the Broadway car, corner of 17th Street at five o'clock, and said good-night. Monday morning we had the news of his death. He must have had a premonition of his going, for his son, Mr. Otto Sarony, his life-long assistant and operator, Mr. Richardson, and Mr. Nice, his artist, in speaking of his last day at the studio, Saturday, said he told them of many of his earlier and boyish exploits, and was unusually bright and chatty, and to me that afternoon he was constantly speaking of his wife and his son with the greatest affection. This side of his nature his close friends knew well, and those who really enjoyed his friendship, had his entire love and affection, and when this was given he would trust implicitly as a child.

"The papers for the past week have been filled with the story of his life and work. The Sunday papers, a week ago, vied with each other in doing him honor. The *World* had several of his first posings in Birmingham of Ida Menkin, just prior to his advent here, and his own portrait, standing with top boot and fur coat, leaning over his own posing chair. These were *cartes-de-visite*, eight on a plate and were printed and sold in this country to photographers as artistic posings. These were charmingly printed on double albumenized paper and in warm, brown tones, the first seen in this country. He also brought out a burnisher, his posing chair, his silk curtain with Grecian border, and many new draperies and backgrounds. He opened at No. 630 Broadway, in 1866. The first sitter was a German tenor singer, and the negative was developed by Mr. Richardson, and every negative since, both wet and dry, has been made by him, and he is still at his post, with Mr. Otto Sarony, No. 256 Fifth Avenue, who, of course, will carry on the business left him by his lamented father.

"Thirty years ago Mr. Sarony, as can be imagined, was the personification of energy and life, and he threw them into his art with all the enthusiasm that youth and genius is capable of. His sitters were the great men and women of the land, and he was one with them. Though small in stature, at times he would seem like a giant, which he was in intellect, and like the gifted Stephen A. Douglass, he seemed larger while sitting, his legs being very short. If Mr. Richardson could be induced to write, how many interesting things he could give, as he has to me, of the amusing battles the Little Corporal had with his army of sitters. Charlotte Cushman was one of his first subjects, and he considered her a good one, and greatly admired her genius, and only lately told me she was the greatest Meg Merrilies on the stage. At her second visit, Mr. Sarony commenced dancing around her in his delight of posing her again. The great woman caught him up in her arms and said in her deepest tone of voice, 'As crazy as ever.' Lester Wallack was inclined to have his own way.

"This with the great Sarony was impossible, and when shown the negatives, as was the case usually in those days, he would storm and blame the little corporal for some fancied mistake in the posing from his point of view. Then would follow a sparring match which would end, as Mr. Richardson says, "with the boss on top." After the fun all would be well and good pictures the result. Bill Tweed was the first stout man photographed. He was leaning over a chair, and could not be got into shape. A blow in the stomach from the little man transformed all this, and Bill was thin. Ristori was a revelation under his hands. He worked her up to such a pitch that the veins on her forehead stood out like whipcords and perspiration started from every pore. Sarony had this faculty of interesting all his sitters, especially actors, in the part they were assuming. That expression and action was everything – that as their acting stirred the hearts and played with the emotions of their audience, so the picture to be great, must have the same soul or life. Then followed Lydia

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Thompson, the queen of burlesque, with Harry Becket, the great comedian, and Pauline Markham: the fair Mrs. Scott Siddons, who only last week passed away, was one of his best subjects. Maude Branscombe, under his magic touch, became spiritually beautiful, and Fanny Davenport's negatives, or, as he called her, the divine Fanny, have never been equalled. Then, such actors as Booth, McCullough, Forrest, John Gilbert, James Lewis, Louis James, and John Drew; public men like Tom Nast, his intimate friend; Blaine, Hayes, Garfield, Grant and Horace Greely came under his spell. Mr. Sarony took the latter just as he was with coat collar turned up and necktie under his ear and very characteristic it was. After several poses Mr. Sarony said that is all Mr. Greely, but found the great newspaper man fast asleep He was in perfect harmony with the divine Sarah Bernhardt, and on her first visit, made an appointment for her at 12 o'clock. It came and passed, one, two and three and still no Sarah: at half-past she came with a rush, but with wet plates and a November day it was too late and the little man was annoyed and told her so. She answered, "Vous n'avez pas de cœur." This aroused Sarony to his greatest energy, and poses were made and plates coated and developed with dispatch, and the results were splendid. Sarah departed quite happy and the little man was well pleased. Between 1870 and 1876 Sarony was at his zenith; he occupied the entire building on Union Square excepting the store, with a rental of $8,000 a year. His price for cabinets was $14 a dozen, and he made from thirty to forty sittings a day. This with wet plates developed at once was no child's play. Mr. Sarony was very popular with all classes; his business brought him in contact not only with the actors and actresses, but with great men and women of this country and Europe. But his warmest friends were among the artists. He was the originator of the Tile, and active in the Kit Kat and Salmagundi Clubs, and beloved by the whole fraternity. His absent-mindedness was proverbial. He was a great frequenter of the opera and the play. One night accompanied by his wife he visited Booth's theatre when that great tragedian was at his best. He had seats well down in front, and he sauntered down with his immense fur-lined overcoat, which he took off and threw over the back of the seat. Between the acts he walked about the foyer, chatting with his many friends, and finally returned to his seat, taking off his dress coat and throwing it over his arm as he walked down the aisle in his shirt sleeves. Everyone in the house knew him and was convulsed. During the winter he used to wear an old straw hat in the studio and frequently he would go down Broadway with an immense overcoat and this little straw hat he had forgotten to change. Latterly he has worn a Turkish fez and all of his later pictures are taken with his fez on. They don't do him justice, as he had a splendid head, and his best portrait is a late one without a cap I will not speak of his later success in charcoal, of which he was a master, nor of his studies from the nude, and his living pictures. We prefer to remember him first and last as our great photographer, who opened up the way and showed the possibilities, and was respected and beloved by small and great, rich and poor.



NAPOLEON SARONY FROM PEN DRAWING BY ISAAC MORGAN, CHICAGO

(From The American Annual of Photography for 1897.)

THE CONFESSION OF A CAMERA FIEND.

Some talk of Alexander, and some of the other man in the rabbit skin, but I question whether either of them took so much pride in his sword or his club as I do in my camera. They knocked people down; I take people off; people are none the worse for me, and my collection is all the richer for them. I have raised the snap shot to a fine art. I not only take my friends' portraits, and inspire them with a wholesome terror of me, as common camera men do, but I have several specialties of my own. For instance, I have gathered an entirely original collection of "Celebrities in the Water." Celebrities on land are three a penny; but to have them in the water is unique, and flattering to the soul. What I do is this: In the season I visit the fashionable seaside resorts, go

out in a pith helmet and umbrella, and take a chair in front of the bathing machines. I hoist the umbrella, and put the helmet in my lap; inside it, is, of course, my camera, with the lens protruding through the ventilating hole. When my celebrity comes to bathe, I snap him off at both ends. When he plunges in, I take his feet sticking out of the water, and when he emerges I am ready with another plate for his streaming beak, blowing like a grampus. My composition plate of the feet of the present Ministry protruding from the briny makes a wonderful picture of how we are governed. Students of character are apt to make too little of the feet. They are seen to be really very characteristic when inverted and the rest of the body hidden by the wave. The longer a man has been in office, the more his feet curl round in a prehensile or ape-like manner, as though determined to hold on like grim death to whatever he seizes. You can tell also by the snub toes which man is accustomed to kick the rest.

The heads of celebrities when bathing offer a new and pleasing aspect. The moustache, which is the glory of the stage or concert platform is now like a couple of limp tadpoles with their tales hanging down; and the famous whiskers which have been the making of a man in the pulpit, resemble a seedy table-cloth brush, too degenerate to sweep anything into the offertory. The wonted sweet smiles are washed out of the mouths, and the chevelures are moppy The heads are, in fact, disillusioned, and one turns with relief to the toes. An agreeable companion to the above is my collection of celebrities suffering from mal-de-mer. I take them on my little trips. Last year I had the good fortune to take one of our foremost judges doubled up over a skylight, limp as a week-old codfish, offering a splendid exposure. Presently he rolled over on his back, and I had a fine topside show. These form a pleasing change from his photo as he appears on the bench, and no more acceptable present could be made to the prison population of the country. I have no end of M.P.'s giving up the ghost, and even a bishop rolling in the lee-scuppers. Men make by far the best subjects for this branch of art; they sprawl more, and pull strychnine faces; whereas, ladies are tame game, indeed, they do not exhibit much more depression than they do at a wedding. I remember how disgusted I was the last time the great Sarah came across the Channel. I know she cannot stand the sea, and went down to Dover to register her agonies; but, bless you, she didn't look half so bad as when she says, "I will love thee ever."

I am proud also of my collection of back views. None but myself seems to have given these views the attention they deserve. Now, people generally exercise some control over the front view they present to the gazer; I have a fine series taken in the parks on summer evenings from behind the seats. There is an infinite tenderness in these back views. They exhibit over twenty different ways in which the head of the cook or milliner's apprentice can recline on the shoulder of the attendant swain, or nestle in the nape of his neck; and innumerable true lovers' knots made by the encircling arms. I have also some choice back views of policemen and chairwomen taken on their leaving areas. The protuberances made by legs of mutton, fowls, and spare linen are great curiosities in anatomy. Then the back is sometimes very deceptive, and I like to show it up, as I do in my double photos, "Look on this picture, and on that." The first is a back view of the Diana or Apollo you often see in the street; all braced in charming lines, jaunty carriage, altogether youthful and fetching. The second, of course, is the same person as seen when you get in front of them, looking like their own grandfathers or grandmothers. The attitude of the public speaker is generally very imposing from the front, but you always get some humor out of his back, whatever you do out of his speech. When he saws the air in denunciation, his coat tails wag like a dog's, and when he weeps in front his shoulder goes right out of joint. In my back views I include those of houses. People's houses are extremely correct in front, with brass door knobs, flowers in pots, and irreproachable curtains; but behind, the frayed muslin comes out, the broken window with the newspaper stuffed in it, and the garments washed at home which are too ragged to be sent to the laundry. You may often, if you are lucky, snap off the master and mistress having words in the back sitting room—a photo which insures you a welcome from any of their friends.

This reminds me of the social aspect of my labors of love, which is a very important one. A good many of my old friends now unaccountably fly when they see me coming, but they would not if they knew what services I can render with my camera. For instance, my friend Robinson has had to part for three weeks with his wife, who has gone into the country to see her mother. He and I arranged that I should take a snap shot at him, quite unknown to him, and send it the lady with my compliments. It was the most touching picture you ever saw of the torments of the temporary bereaved. He lay prone on a garden seat, with his face all drawn up in agony, his necktie undone, one end of his collar unbuttoned, sopping kerchiefs lay around, and by his side was an untouched veal and ham pie, from which he recoiled as loathing food. After taking the shot we went off to dine together at the Thames Hotel, Robinson, of course, standing treat. The photograph was a wonderful success, too much so, unfortunately, for it caused the lady to return home before her time. Then I obliged my old friend, Miss Highflyer. She confided to me that she set her cap at MacBawbee, the great importer of Scotch beef from Canada. MacB. was well alight, and rubbed two sixpences together in his pocket in an emotional manner whenever he saw her; but it was discovered he had doubts of her domesteecity." So I took a snap shot of her as she appeared in a housemaid's gown, peeling potatoes, and giving her eyes to a porridge pot. That photo fetched him, and she now rubs his sixpences for him. My art has also enabled me to put a little pressure on that syren, Miss Green. She does not seem to favor my advances; in fact, I overheard her say to a friend, as I approached her smiling the other day, "Here comes that little cad again." But now, at any moment, I can have my revenge. I have a negative at home which will make her sit up and be civil. She has lately taken to cycling, riding but very slowly, and a happy thought struck me while smarting under her rebuffs. Concealed by a tree in the park I took her on her cycle. During the time of the exposure she had moved about a yard; consequently the photo, which is a good likeness in the face, represents her as about four feet thick on the average. If she continues to snub me, round it goes to our mutual friends, who

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will be delighted to have it in their albums.—*Allahabad Post.*

HOCHSTADTER'S FORMULA FOR PLATINUM DEVELOPER.

COLD PROCESS.

Oxalate of Potash Neut	14½ ounces
Bi-Phosphate of Potash	1½ ounces

Dissolve in 100 ounces of water. Distilled is best.

INTENSIFYING, REDUCING AND TONING SLIDES.

BY E. J. WALL.

THIS world would be a totally different thing were there no failures, and the next best thing to making failures is to know how to rectify them

Errors in exposure, at least ever-exposure and under-development, can be rectified by intensification, whereas over-development may be remedied by reduction.

Intensification may lead to a totally different change of color, and for this very reason sometimes expert lantern-slide makers resort to this always to obtain a particular tone. A lantern slide does not differ from a negative as to the treatment required in intensification and reduction; but in order to make this series of articles complete, and avoid the necessity of reference to books, the formulæ for the principal intensifiers and reducers will be given.

The slide must be well washed to free it from hypo, then bleached in

Mercuric chloride	100 grs.
Ammonium chloride	100 "
Water to	10 ozs.

Then well washed and blackened in one of the following solutions:—

Sodium sulphite	5 per cent. solution.

This gives black images with a slightly warm-brown tinge.

Ammonia	5 per cent. solution.

This gives black images.

Silver nitrate	100 grs.
Distilled Water	5 ozs.

Dissolve and add gradually

Potassium cyanide	100 grs.
Distilled water	2 ozs.

The mixture must be well shaken after each addition, and a little precipitate allowed to remain undissolved. This gives warm brown black tones.

If the bleached image is re-developed with ferrous oxalate hydroquinone, or metol developers, pure black tones are obtained.

For very warm reddish-brown tone it is advisable to develop with any but an iron developer, and not to develop too far, to fix and well wash and treat the plate with the uranium intensifier.

Uranium nitrate	100 grs.
Potassium ferridcyanide	100 "
Glacial acetic acid	½ oz.
Water to	20 ozs.

when according to the length of immersion, the image will be brownish black, warm brown or even reddish brown. Slides after this intensification should not be washed much, and preferably in acidulated water.

According to a recent writer in a German contemporary, whose formulæ we have not yet tried, other tones may be obtained by treatment as follows:

Orange Tones.

A. Potassium ferrocyanide	1½ grs
Water	1 oz
B. Uranium nitrate	5 grs.
Ammonium sulphocyanide	25 "
Glacial acetic acid	5 "
Water	8 oz.

Mix in equal parts before use and flow over the slide. If the whites are tinged, then this may be removed by using a solution of

Carbonate of soda	1 gr
Water	1 oz

For blue tones this author suggests

Ferric oxalate	1½ grs.
Potassium ferridcyanide	1 gr.
Water	2 ozs.

This solution must be freshly prepared or else kept in the dark.

Green tones can be obtained by treating the slide after the above bath with a weak aqueous solution of potassium chromate and drying in the air.

Red tones may be obtained with

Potassium oxalate (saturated solution)	2 ozs
Cupric oxalate	4½ grs.
Potassium ferridcyanide	1 gr

Very warm sepia tones may be obtained with a very dilute solution of ammonium molybdate in oxalic acid, to which 3 to 4 per cent. of potassium ferridcyanide has been added.

It frequently happens that a slide, whilst otherwise perfect, shows a faint fog and flatness; in this case it may be first rinsed with a 5 per cent. solution of ferric chloride and refixed, or else flowed once or twice with a reducer, then well washed and intensified if required.

Farmer's reducer, which, as everybody knows, is merely the addition of a few drops of a 10 per cent. solution of potassium ferridcyanide to some clean hypo solution, the action depending upon the amount of ferridcyanide present, may be flowed once or twice over the slide to just reduce it, while a longer immersion will reduce it still more.

Belitzski's reducer is my favorite, only because it can be kept in stock solution.

Potassium ferric oxalate	200 grs.
Sodium sulphite	200 "
Water	5 ozs.

Dissolve the iron salt, add the sulphite, and add

Oxalic acid (crystal)	75 grs.

till the solution turns green; decant from any undissolved acid and add

Hypo	2½ ozs

and sufficient

Water to make	10 ozs

Frequently flowing a slide with a solution of citric or sulphuric acid and alum is sufficient to clear up the high lights and give the last touch of brilliancy.

In all cases, however, I advise the application of an acid clearing bath, and gentle friction with a tuft of cotton wool to clear off any possible deposit of lime or earthy salts from the water.—*The Photographic News.*

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THE ALCHEMIST

BY FRED. BOISSONAS

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NOTES.

The Prince of Wales recently had his hand radiographed.

The Y. M. C. A. of Evansville, Ind., is organizing a camera club.

The London Camera Club recently held a most successful exhibition.

A Photographic Union has been successfully inaugurated in New South Wales.

The Anarithmoscope is the name of the latest device for producing animated photographs upon the screen.

The London Salon was a grand success. The sale of pictures was considerably in excess of last year.

Hand Camera Lenses often get dusty without the photographer knowing it. Give them a good overhauling occasionally.

"Your 'Annual' for 1897 is just to hand. It is a beauty," writes Mr. B. J. Falk, the well-known photographer.

The First Edition of 12,000 copies of "The American Annual of Photography" for 1897 is almost entirely exhausted. Have you received your copy? Many hundreds were disappointed last year.

Hamburg Exhibition.—At the exhibition recently held by the Hamburg Photographic Society, the following Americans exhibited: A. L. Eidemiller, Chas. E. Fairman, W. B. Post, Alfred Stieglitz and James Wilson.

The First Annual Convention of the Photographers' Association of Pennsylvania, will be held at Harrisburg, January 26th, 27th and 28th. Full particulars can be obtained from E. E. Seavy, Secretary, New Castle, Pa.

McClure's Magazine for November contains an article by Mrs. D. T. Davis on the introduction and development of the daguerreotype in America. The article is illustrated with original daguerreotype portraits of Webster, Greeley and many other notabilities.

A Treat for Artists.—The Autumn scenery of the Hudson River and Mohawk Valley lends additional charm to a trip over the New York Central at this season. Fourteen fast trains every day between New York and Buffalo and Niagara Falls.

A New Focus Tube.—The chief inprovement made by the followers of Roentgen, says *Invention*, have been in the line of concentrating the X rays so as to give sharper shadows. A French physicist, M. Gouy, now proposes a new kind of focus tube in which the cathode is in the form of a portion of a cylinder, which focuses its rays upon a very narrow platinum strip, from which they pass as a line that becomes scarcely more than a point at the place where it is made to strike endwise against the glass wall of the tube. Glass, it is well known, is very opaque to the Roentgen rays. Professor A. Roiti has therefore devised a Crookes tube in which an aperture in the glass is closed by a cap of aluminum, which serves as the anode, and through which the rays pass more readily than through the side of the ordinary glass tube. Photographs of bones, etc., show that the new tube gives decidedly increased sharpness of definition. In pictures taken to show the interior of bones, some details of structure are lost through over-exposure, and a plan for getting views of all parts is to expose a pile of half-a-dozen or more sensitive plates together. If the top plate is suitably exposed for the least transparent tissues, the plates lower down will have the exposure necessary to show other portions.

A Very Simple Method of Trimming and Mounting Prints.—Many amateurs manage their work admirably well until they come to the mounting of their prints, and as they approach this stage it is with great fear and trembling, for which there is absolutely no necessity. In this respect I have had no fear since I was recommended by an old hand to adopt the following method: I first trim my prints by laying them upon a piece of plate glass, which I keep for the purpose, then I place my cutting shape into position. It is now important that the condition of the knife should be looked at. I have a piece of emery cloth, F F and F, glued upon each side of a piece of wood. To give the knife a rub or two upon this gives it a splendid edge in a moment or so. Should the edge be a little rough you can smooth it by rubbing it on a piece of plain wood.

Everything being now ready I trim my prints, then tone, fix, and then place them into the alum bath (which never should be omitted), as it hardens the surface of the prints. After the usual washing I clean an old half-plate negative. I then lay it upon a towel or a piece of old twist sheet to absorb the surplus water. I now take the prints from the water with the left hand; having a sponge in the right hand I wash the plate of each print, then laying them one upon another face down, this being repeated until all the prints are in position.

Then I take a piece of blotting paper and lay upon the top of them, and with the hand or squeegee press all the

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surplus moisture out of them. This being done, the prints are now ready for mounting.

I place my mounts on the table to my left, the mounter and brush to my right. I now apply the mounter to the print, being careful to cover the edges. Then I gently raise it with the edge of my pocket knife, lay it in position upon the mount, then place upon it a piece of thin india-rubber or a piece of vegetable parchment such as provision dealers use to wrap their butter in, then with the hand or squeegee press the print into position.

Now raise the parchment carefully from the print and set it to dry.

Any mark upon the surface will disappear when the print is dry.

So finishes this simple method.

I use the Higgins Photo Mounter, as I find it the best in the market.—A. G. J. in *The Photographic News*.

Mounting Gelatino-Chloride Prints.—In mounting prints on P. O. P. or any similar gelatine paper with starch or other water mountant, great care must be taken that none of the moisture gets on to the face of the print, for in that case the gelatine would become so softened that portions of it would be almost certain to leave the paper when the print is being pressed on to the mount. The best and safest way of applying starch paste for mounting purposes is as follows: Take an old newspaper, or better still, a back number of any periodical in book form (except, of course, the *A. P.*), and opening it at the first page, lay a print face downwards upon it, and place a small quantity of newly-made and still warm starch in the centre. Spread the starch with the fingers all over the back of the print, except at the extreme edges. Then with the fingers of one hand hold the print firmly, so that it cannot slip, and with the other spread the mountant over the edges, and keep on rubbing it into all portions of the print until it lies flat upon the paper. If no more than the right amount of starch has been used, there will by this time be only enough to form a thin film upon the back of the print. Now treat another print in the same way, and a third, and even a fourth, by which time the first will be quite limp. Then very gingerly spread a small extra quantity of starch upon it—only just enough to make the fingers slide over it, holding it firmly down with the other hand meanwhile, and then lift it by the corners and place it in position upon its mount to which it should be vigorously beaten —not rubbed down—with a soft handkerchief. A good plan is to lay it on a table and thump it with the soft part of the fist to ensure perfect adhesion between print and mount. Now subject a fifth print to operation No 1, upon a fresh piece of paper, and the mounting of the second may then be proceeded with, and so on to the end. Should a small quanty of starch by any chance creep round to the face of the print, it should be immediately removed by very gentle rubbing with a soft, wet cloth.—*The* (London) *Amateur Photographer*.

Blue Tones on Lantern Slides.—The lantern plate developed in the ordinary manner and well washed is immersed in the following solution.

10 per cent. uranium nitrate solution,	10 cc.
Distilled Water	100 cc.
10 per cent. potassium ferricyanide solution	10 cc.
Distilled Water	100 cc.
Glacial acetic acid	10 drops

After adding the acetic acid the two solutions are mixed In this toning solution the transparency assumes in succession a brown sepia and red tint, after which it is washed in running water for two or three minutes and then dipped in a 25 per cent. solution of sulphate of iron, which changes it to a blue or green tone, according to the depth to which the first toning has been carried. The redder the preliminary toning the bluer will be the resulting color.—M. Gaumont in *Bull. Soc. Fr. Phot.*, translated by R. C. B. in *The Photographic Journal*.

The Photographers' Association of Michigan will hold a convention at Detroit, February 2 and 3 next. Applications for space and full particulars can be obtained from Mr. Charles E. Heath, 145 Monroe Street, Grand Rapids, Michigan.

Removable Backing for Dry Plates.—The most common complaint, in reference to backing plates to prevent halation, seems to be the "messiness" of applying the mixture to the glass. Personally, we find none of this annoyance; and we believe that others who have ever actually undertaken to back a plate realize that there is really very little mess or trouble about the operation. The universal demand is for a sort of removable backing that can be attached to a plate in an instant and stripped off as quickly; but these, as a rule, are rarely effective.

The following plan, recommended by Dementjeff, looks more promising than any other we have yet heard of:

A sheet of glass is cleaned and talced, and the talc is removed from the edges to the width of about a quarter of an inch. The plate is then coated with enamel collodion and allowed to dry; it is then placed on a leveling stand and coated with a 10 per cent. gelatine solution to which a little glycerine has been added.

When this substratum is dry, the plate is coated with colored gelatine, prepared as follows:

Twelve parts of gelatine are allowed to swell in 90 parts of water, melted in a water bath, and then 8 parts of sugar and 80 parts of glycerine are added. The mixture is then colored with aurine, chrysoidine, and methyl violet; the following proportions being used:

Gelatine solution (as above)	60 parts
Saturated alcoholic solution of chrysoidine	2 parts
" " " " aurine	2 parts
" " " " methyl violet	½ part

The film will be in proper condition for use in about two days, when it may be stripped from the glass and cut into suitable sizes. It is used as a backing, by merely squeegeeing into contact with the back of the plate with a roller squeegee. It can be easily stripped after use, leaves no stain, and may be used again and again.—*The Amateur Photographer*.

Blind to the X Rays.—In the *Public Ledger* we read of some important experiments recently made with the X rays. Mr. E. E. Allen, Superintendent of the School for the Blind, Twentieth and Race Streets, with two blind students, visited the X ray laboratory of John Carbutt, at his dry plate factory, Wayne Junction, for the purpose of testing the efficiency of the X rays as to their enabling the blind to see either light or objects. Both boys were intelligent pupils of the school. One had

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become blind soon after birth, but could see light and distinguish objects: the other had been blest with his eyesight up to his 13th year, but for several years had been nearly totally blind. The first experiment, the room being darkened, was to cause an intense spark to cross the terminals of a powerful induction coil. Each pupil in turn stood before the coil, being instructed to direct their eyes across the spark, but neither could detect any visual effect, and only the noise of the snapping of the spark was heard by them; then a Crookes tube was excited by the induction coil, giving off an abundance of X rays. First each pupil was seated before the tube and the X rays directed toward their eyes, but without any sensation of light. Then a fluorescent screen, without its frame, was held in front of the tube, giving a bright fluorescence, and still no light sensation was made on the optic nerves, and no effect when held to side and back of the head. Then a fluoroscope was held before the eyes of one who in his earlier years had his eyesight. At first he thought he could discover the difference between when the field of the fluoroscope was clear and when partly darkened by the hand or an opaque object held before it. On placing his own hand in front of the fluoroscope and asked to open and close the fingers, he exclaimed somewhat excitedly, "yes, I see," but on a further test by placing another person's hand on the fluoroscope, he could *not* detect any form, and afterward said the seeing the shadow of his own hand must have been imagination, knowing it to be his own hand and conscious of moving his own fingers. As to the other pupil, who was born blind, but yet can discern the direction of a window by the light coming through it, the X rays made not the slighest impression on his eyes. These experiments while they may not be conclusive, go to show that there is little to hope in any benefit to the blind being derived from the use of the X rays.

The boys had explained to them the value of the X rays in locating foreign substances in various parts of the human body, and were allowed to handle the mummied hand and foot from the body of an Egyptian princess, which seemed to interest them even more than the X rays, because by their acute sense of touch they really perceived the object. Mr. Carbutt very kindly offered to continue the experiments, and in the near future Mr. Allen may take out to Wayne Junction other pupils who have different degrees of blindness.

The pupils (Lee Parts, aged 16, and Charles Ruddy, aged 21), were not at all disappointed over the result of their visit, as Superintendent Allen had forewarned them that there was practically no hope of benefit to them from the discovery. In fact, Mr. White recently assembled the whole school and warned the members not to permit their hopes to be raised by what they would be apt to hear about the X rays making the blind see.

The Royal Photographic Society's Exhibition was also a most successful one. Many of the pictures will go to Calcutta for the Exhibition of the Photographic Society of India.

Indian Photographic Exhibition.—The annual International Exhibition held in connection with the Photographic Society of India will be opened in Calcutta on the 15th of January next.

Could See Gold.—Physician of the new school after turning X rays on patient: "Your case is a somewhat complicated one. There is a slight trouble with your left lung, and I observe enlargement of the liver and fatty degeneration of the heart. Kindly hand me those two sovereigns in your right hand trousers pocket and I will prescribe for you."

"**The principal object** in a landscape is the foreground, and curiously enough there is nothing in which photographers more generally err by giving it too much space and too little attention. The foreground of a picture should be like the entrance hall of a well equipped and tastefully finished mansion, never large enough to dwarf the more important rooms to which it leads, but so furnished as to give an idea or foretaste of what is beyond."—JOHN CLARKE.

Ferric Sulphate as Restrainer.—Le Roy, in the *Bulletin de la Société Française*, suggests the use of ferric sulphate as a restrainer in the ferrous-oxalate developer, and states that it is better than using an old developer, as its action is more certain. About ten or twenty drops of a 10 per cent. solution should be added to each ounce of the developer.

Varnishing Films.—Balagny recommends giving cut films a coating of 3 per cent. amyl-acetate collodion, to which about 2 per cent. of castor oil has been added. The film should be fastened by pins to a board, and brushed over with the above varnish, a narrow margin being left untouched. When the varnish is dry, the film should be turned over and treated in exactly the same way. He states that films treated in this way will not curl.

Fog on Celluloid Films.—Hans Klep think that the markings or fog sometimes observed on sensitized celluloid films is due to the action of camphor vapor on the silver salt, this vapor being set free by electrification at various points, or by the action of the salts left in the film.

To Clean Lenses.—Lenses may be cleaned by rubbing them with them cotton wool moistened with a mixture of distilled water, 2 ounces; alcohol, 1 ounce; nitric acid, 3 drops, and then polishing with wash leather.

To Clean Glass.—When extra clean glass is wanted for photographic purposes, the following will be found the very best glass-cleaning mixture it is possible to make, according to the *Photographic News*:

Powdered pumice stone	1 ounce
Powdered chalk or whiting	1½ ounces
Ammonia	½ ounce
Soft water	1 "

Apply with a piece of wash leather, and polish with a piece of rag or soft paper. Dirt will vanish as if by magic.

Backing for Process Dry Plates.—Now that process dry plates are coming into use, it would be wise to have a piece of cardboard the size of the dry plate used, and covered on one side with black velvet, to back the plate

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up with and prevent halation. Sometimes the brass spring on the plate-holder door becomes so polished where it presses against the glass that it reflects two bright spots of light that, if noticed, are usually attributed to "dirt in the glass." The black velvet, or other light-absorbing backing, prevents all such trouble.

Intensification.—Paul V. Janko has been determining the various degrees of intensity given by the best known intensifiers, and has drawn up the following table:

Bleached in	Blackened by	Ratio of Intensity
Cupric Bromide	Metol	15 : 14
"	Hydroquinone	15 : 13
"	Pyrogallol	15 : 12
—	Silver Nitrate	15 : 8
Mercuric Chloride	Mercuric iodide (Edwards)	15 : 10
"	Sodium sulphite	15 : 14
"	Ferrous oxalite	15 : 13
"	Hydroquinone	15 : 12
"	Hyposulphite, or with ammonia	15 : 11
"	Ammonia	15 : 10
"	Ammonia, the plate being dried before blackening	15 : 8.5
"	Ammonium sulphide	15 : 7
—	Uranium	15 : 6

The uranium intensifier gives the greatest increase, next ammonium sulphide, a result which agrees with practice.

Magic Pictures, which only become visible by gradual development on the lantern screen, are made as follows: Upon a glass of the desired size, perfectly clean, we pour a solution of india-rubber in benzine, working as we should do with collodion, of a strength analogous to that of collodion. This must be allowed to dry, after which it is placed upon the design that we desire to reproduce. (There is nothing to prevent this from being a photograph.) Then with a very fine brush, dipped in a solution of bromide of copper, we trace the design. If the lines made are very heavy, the image will be visible, and the effect will be wanting; it must therefore be done very delicately. After having outlined the image, we carefully paint the trees, foliage, grass, in a word, all the verdure, with bromide of cobalt; the sky and water must be done with a solution of acetate of cobalt, with the aid of a very soft and fine brush. We mount this as we should do an ordinary lantern slide. If the work is well done, the image ought to be entirely invisible, but, when placed in the lantern, it will gradually appear to perfection under the influence of heat. By these means may be depicted winter scenes, which under the action of the heat of the fire are transformed into scenes of summer; these return to their primitive appearance on cooling. With a little care and ordinary skill it is possible to obtain this pleasing and novel transformation with photographs.—*Post Express, Rochester, N. Y.*

A Good Method of Local Intensification.—A method of local intensification which gives opportunities for artistic treatment is as follows:—First remove all hypo from the film by thorough washing and immersion for twenty minutes in a solution of chrome alum and citric acid, each one ounce in a pint of water. Then intensify the whole negative with the usual uranium intensifier made as follows:—1. Uranium nitrate, 15 grains; water, 4 ounces. 2. Ferricyanide of potassium, 15 grains; water, 4 ounces. Mix 1 and 2 in equal parts, and to every 100 parts of the mixture add 10 parts of glacial acetic acid. As soon as the required degree of intensification of the given parts has been reached, wash the negative well and remove all water from the surface with blotting paper, so that the film is only moist. Brush over the too vigorous places with diluted ammonia (1 part ammonia of specific gravity 0.96 in 20 parts of water) with a soft hair pencil. The intensification quite fades away in these places. After treatment with ammonia the negative is again well washed.—*G. E. B in The Photographic News.*

Photo-Recording Devices.—"There appears to be room.," says the *Optician*, "for a good many applications of the principle of photographic recording in connection with teleautograph receivers. Some of these instruments, constructed on purely mechanical principles, involve so much friction that it is practically impossible that they should be made to work satisfactorily. The 'syphon' recording pen is used in some of the best instruments of this class; but the trace of a fine pencil of light could be made to respond even more perfectly to differential magnetic impulses."

Sunlight at Sea.—Even where the depth of the sea is 1,580 feet, sunlight will penetrate if the water is very clear. Experiments which were made in the Mediterranean, near Corsica, 18 miles from the land, prove this to be the case, and the results were shown by means of photographic plates. The depths to which daylight will penetrate depends, of course, upon the transparency of the water. The Mediterranean is famous for the clearness of its depths, and will admit light to a very great depth. Usually the light of the sun at 150 ft. below the water surface is no more powerful than that of the moon, but at 300 ft. it is scarcely equal to the glimmer of twilight, and at 600 ft. there is generally perpetual darkness. The spotted corals are plainly visible near Mindora in the Indian Ocean at 150 ft under water. The Caribbean Sea, which is of crystal clearness, shows objects at the bottom at a very great depth.—*Invention.*

Hardening Gelatine Prints Without Alum.—The following bath is said to be excellent for making the surface of gelatine prints extremely hard:

Tannin	1 gr.
Sodium chloride	10 gr.
Saturated solution of potassium aluminium sulphate	100 min.
Distilled water	2 oz.

After fifteen minutes' immersion the prints can be pressed between blotting paper without sticking. If dried on glass plates previously rubbed with talc, they may be dried at a temperature of 85 deg. F., and will leave the glass in about half an hour with an indestructible gloss. If the prints should be touched with wet or greasy fingers it is only necessary to rub them with a dry rag to remove every trace of the marks. The whites remain quite pure, and prints treated in this way can be retouched without leaving perceptible traces of the work.—*The Amateur (London) Photographer.*

Copying Line Drawings.—It occasionally happens that an amateur finds it necessary to make a negative from a newspaper illustration of the common type—

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black lines on a white ground—say for lantern slide purposes. It is an operation which is by no means as simple as it might appear. Newspaper illustrations of the "pen and ink" variety—such as those by Phil May and Reginald Cleaver, to take two diverse examples—are often printed on thin and to a certain extent transparent paper, so that in the white spaces the drawings on the opposite side occasionally show through. Pin the sheet of paper to be copied to a board faced with black velvet, and this difficulty will disappear, for everything being in black it will make no difference whether it has black lines upon its back or not. See that both glasses of the lens are carefully cleaned; that the print is brightly and equally lighted, but in such a manner that there can be no reflection from the shiny surface of the printing ink, into the lens—bearing in mind that the angle of reflection is equal to the angle of incidence. Use as large a stop as is compatible with good definition, use photo-mechanical plates, develop with hydroquinone, and be very careful not to over-expose. Remember, the quality to be arrived at is absolutely clear glass lines on a dense black ground. Continue development only so long as the lines remain absolutely white as the plate lies in the dish, then immediately stop it, and further density must be obtained by after intensification.—*The (London) Amateur Photographer.*

Silver Prints can be transformed into blue or red by the following methods. The print, after careful washing, is placed in a bath of

Ferric oxalate	1 gramme
Red prussiate of potassium	1 gramme
Water	1000 c.c.

Which tones the print to a blue.

To tone this blue to violet it is placed in a bath composed of

Water	100 grammes
Chloride or sulphate of copper	1 gramme

To which is added enough carbonate of ammonia to dissolve the first precipitate of carbonate of copper which is thrown down, making a deep blue solution. The longer the print remains in this the redder it will become. In order to change it into an entirely red print, it is placed in a bath made by adding a saturated solution of ammonia to a 1 to 2 per cent. solution of copper chloride or sulphate, until the precipitate thrown down is redissolved, and then adding to each 100 c.c. of this solution one-half gramme of red prussiate of potassium. The red tone of the print is entirely different from that obtained with uranium. The best results are obtained with bromide and salted papers.—*Photo. Gazette.*

A Simultaneous Printing and Toning Process.—This is the invention of Messrs. Paul Emil Schoenfelder and Emil Kehle, who state that its object is to provide a chemical compound or composition for the preparation of paper, especially glazed paper, porcelain, or any other suitable material, on which photographic prints are to be made from a negative plate, whereby the toning of the picture is accomplished simultaneously with the printing, and thus the subject of the print, after it is made, to a separate toning bath, is fully avoided.

The composition consists of the following ingredients, combined in the proportion stated, and which we will call stock or ground solution:

Stock Solution A.

Collodion.

Pyroxyline	200 grains
Ether	1 pound
Alcohol (absolute)	1 "

Stock Solution B.

Fifteen grains of chloride of a metal of the platina class, such as chloride of gold, or iridium, of rhodium, of osmium, of palladium, or of platinum.

Said fifteen grains of chloride being dissolved in half an ounce of alcohol (forty per cent.)

From the Stock Solution A one and a half ounces is thoroughly mixed with ten drops of Stock Solution B, and the following ingredients are added in the proportions stated, viz.:

(*a*). Three grains of an organic acid, such as citric acid (tartaric acid, formic acid, etc.), which is dissolved before mixing with the other ingredients in three drops of alcohol.

(*b*). Fifteen grains of nitrate of silver, or its equivalent, first dissolved in fifty drops of forty per cent. alcohol.

(*c*). One and a half grains of a chloride—such as chloride of strontium, or of barium, or of zirconia—dissolved, before mixing with the other ingredients, in three drops of forty per cent. alcohol; and—

(*d*). Two drops of a softening chemical, such as glycerine or castor oil.

The above emulsion is applied to the surface of the material on which the picture or photograph is to be printed. The surface must be thoroughly dried before using.

After the print has been made, it is given a bath in a solution of hyposulphite of soda, one part to fifteen parts of water, in which bath it remains until all superfluous chemicals have been removed from the picture (about five minutes), when it is taken out and thoroughly washed in clean water.

The picture is then ready for mounting, and does not require any additional toning, as the toning has been accomplished simultaneously with the printing, and it has a superior finish, that will not fade or turn yellow by being exposed to light.

In place of stock solution A, a solution can be used composed of gelatine one part and water three parts, in which case the ingredients mentioned under *a*, *b* and *c* are dissolved in water instead of alcohol.

The claims are:

1. A chemical composition to be used for preparing the surface of suitable material for photographic purposes consisting of a chloride of metal of the platinum class, of nitrate of silver or its equivalent, a holding substance, and an organic acid, such as citric acid.

2. A chemical composition to be used for preparing the surface of suitable material for photographic prints, consisting of a salt of a metal of the platinum class, of nitrate of silver or its equivalent, a holding substance, such as collodion, an organic acid, such as citric acid, and glycerine or its equivalent.

3. A chemical composition to be used for preparing the surface of suitable material for photographic prints consisting of a holding substance, such as collodion, a salt of a metal of the platinum class, of nitrate of silver or its equivalent, a chloride, such as chloride of strontium, a softening ingredient, such as glycerine, an organic acid, such as citric acid

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ON THE COLOR OF NEGATIVES AS INFLUENCING THE PRINTS FROM THEM.

BY W. K. BURTON.

Those who remember the introduction of the present dry-plate process—or rather the time when it began to oust the wet plate—will also remember the marvelous colors of many of the negatives that were produced, and also the astonishment of old hands—not yet converted—that some of these negatives certainly miserable looking objects, as compared with a collodion negative, would produce really good prints. Often we have heard the exclamation, "You don't mean to say you expect to get a decent print from *that*!"

It is all a case of color of negative. This is a subject that used to be much discussed, but that is little thought of now, modern developers nearly all giving a close approach to black in the image. A communication to a contemporary called our attention to the subject some time ago, and caused us to hark back to the presulphite days, and to develop some plates with several of the old developers that gave a distinct brown or yellow image.

In considering this subject, it is necessary to make a clear distinction. If a negative is colored, there may be one of several things. The *image* only may be colored, the shadows, if these be without deposit, being clear and colorless; the *film* may be colored, in which case the clearest shadows will show the tint as well as the image, or the *shadows* alone may be colored, as in the cases of green and red fog, pests of fifteen years ago that are scarcely known now. Of green and red fog we have nothing to say here. In the early days of gelatine dry plates, using the pyro developer; about the best, that was looked for was a colored image *plus* a colored film. The color of the deposit by transmitted light was a greenish brown, and that of the film a yellow, or in some cases even a brown.

These old negatives gave magnificant prints, but oh! what a time the printing took! and there was no bromide paper in those days.

Then there came the introduction, by one who signed himself "J. C.," of the acid alum bath—saturated solution of common alum 19 parts, hydrochloric acid 1 part. By the use of this the color could be removed from the film, but not from the actual image, though that was made to appear more nearly black, on account of the removal of the yellow color from the film in which the deposit of silver was embedded. It was noticeable that distinctly softer prints resulted after treatment with the acid alum bath than before, from which fact some argued that the opacity of the actual image was reduced. Probably it was not, but the action was the converse of that in which we print through light yellow glass, if a negative is *just a shade* too thin. We do not know that any explanation has ever been given of the undoubted fact that a slightly stronger print is got if the light be yellow than if it be white. The effect is not due merely to the longer time taken in printing. The use of a yellow film for printing through, when negatives are just a trifle thin, has been known for a long time. In the old books on the wet process, we find it recommended, in the case of which negatives, to varnish with a yellow varnish.

To return, however, to negatives of the presulphite days. It may be of interest, as a matter of history to note that sulphite of soda was recommended by the late Mr. Herbert Berkley long before the acid alum bath, but that the suggestion fell flat, and remained so for years. Perhaps this was due to the very imperfect supply of even fairly good sulphite at a moderate price. We remember finding the first sample of sulphite a complete failure, and concluding that there simply was no effect at all brought about by the use of the substance. It was only when Mr. Berkley showed the result of the use sulphite at the (now Royal) Photographic Society of Great Britain that the use of it became general.

The negatives with colored image and colored film gave, as we have stated, splendid prints, but they were "too awful" in the matter of time of printing. They became things of the past as soon as a way was found of removing the color from the film.

How about a negative with a colored image and a clean film, however? One that will be got by the use of nearly any of the old developers, such as, for example:

A.

Pyro	1 ounce
Citric acid	½ ounce
Water up to	10 ounces

B.

A ten per cent solution of crystalline carbonate of soda

For use 1 ounce of B and 40 minims of A to be taken, the whole to be made up to 2 ounces with water.

Negatives to be treated with the acid alum bath.

Those who are accustomed only to the most modern developers, always give black images, will at once note one thing on using such a developer, as this, namely, that if development be carried so far as to give a density that appears to them to be right, the prints, by nearly any process, will be very hard. Indeed, when the image is of a distinctively greenish brown color, the negative that will give a good print is a very poor thin-looking object. The question is, does such a negative give a better print than is got from a negative with a black image of a corresponding density.

We have made some experiments to try to decide this question lately. We produce some negatives, using the developing formula given above, and looked out some negatives made about eight years ago, at a time when we could not get a supply of sulphite, and printed on the same kind of paper from thin and from negatives with black images. It is very difficult to be sure of the result of comparison in such cases, because it is difficult to be at all sure that negatives with different colors of image have "corresponding densities." It appeared to us, however, that at least in the case of silver printing processes—those tried were albumenized paper, plain paper, gelatino-chloride and collodio-chloride—an advantage was derived from the color of the image. Toning seemed to be easier, and the resulting color seemed to be more pleasing in prints from negatives with a colored image than with a black.

At any rate, this is a subject worth more consideration than it receives at the present time.

We conclude with the time-worn advice to remember that the negative is only a means to an end, not in itself an end.—*Photography*.

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TRADE NOTES.

M. J. Delvaille has purchased the entire stock and good will of The Photo. Co., of 829 Canal Street, New Orleans, La.

The Taber Bas Relief Photograph Co. have instituted an action against Theodore C. Marceau for infringement of their patent for making embossed photographs.

The firm of Loar & Co., of Grafton, West Virginia, has been dissolved by the mutual consent of the partners. Hereafter the business will be conducted by W. R. Loar.

We are pleased to learn that the artistic abilities of Messrs. Gilbert & Bacon, of Philadelphia, are recognized in other than this country, for their pictures received the highest award at the recent convention of German photographers, held at Triu, Germany, August 25th to 29th. We congratulate Gilbert & Bacon.

We learn that the exhibits of the Actien Gesellschaft fur Anilin Fabrikation, of Berlin, Germany, have obtained the gold medal offered at the Berlin Industrial Exhibition for 1896 and the International Exhibition for Amateur Photography, held in the Reichstags building (Parliament House), Berlin. This fact speaks well for the quality of the products made by this company.

Travel Up to Date.—The New York Central offers unequalled advantages for through travel between the east and west. It is the only Trunk Line entering the city of New York; its Grand Central Station is in the very centre of the metropolis, in the midst of the hotel, residence and theatre district; it is the only line protected its entire length by Block Signals; it has the fastest trains in the world; the finest equipment; scenery including the Hudson River, Mohawk Valley and Niagara Falls.

Photographic Amusements.—Under the title of "Photographic Amusements," The Scovill and Adams Company, of New York, have issued a book crammed full of descriptions and illustrations of curious and novel photographic diversions. The contents have been compiled from various sources, under the editorship of Mr. Walter E. Woodbury, who claims no part of the book as his own work, save the collecting and embodying the articles in book form. Among the many subjects dealt with we notice magic photographs, spirit photography, photographs on silk and various fabrics, freak pictures, caricature photographs, composite photography, doubles, and comical portraits. The published price of the volume is one dollar.—*The Photographic News.*

The entire edition of this work has already been nearly exhausted and a new edition is being prepared. It holds the position of being the best selling book ever issued by the publishers.

NOTES ABOUT PHOTOGRAPHERS.

Alfred Stieglitz has postponed his trip to Europe.

Hinsdale Smith was awarded a bronze medal at the Stanley show in London.

Dr. Nansen made upwards of a thousand photographs during his recent trip to the Arctic regions.

C. P. Goerz has been awarded a gold medal "for industrial progress."

W. B. Post has, we are happy to state, entirely recovered from his recent illness.

Cecil E. Hertzlet, whose picture of a wayside shrine appears on another page, has been appointed British Consel General at Havre.

David Tucker, of Buffalo, announces the marriage of his daughter, Mary Graham, to Dr. Grover William Wende. Our congratulations to the happy pair and the genial father of the bride

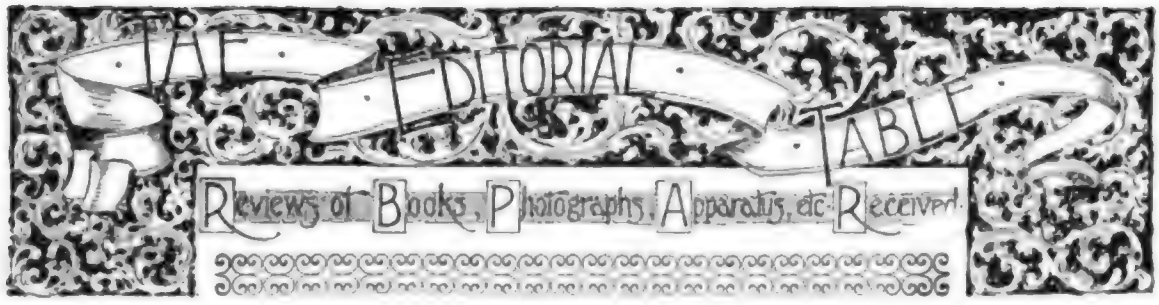


EDGAR G. LEE

Edgar G. Lee is one of England's cleverest hand-camera workers. His snap-shots of street life have made him famous. He is the possessor of a PHOTOGRAPHIC TIMES silver medal.

Wm. A. Eddy, of Bayonne, N. J., has succeeded in making some interesting kite photographs. An illustrated article on the subject from his pen will be published in our next issue. Don't fail to receive a copy.

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The Elements of Stereoscopic Photography. By .C F. Seymour Rothwell, F.C.S. London: Percy Lund & Co., Limited. Price 6d net.

This ever fascinating pastime is thoroughly dealt with in this little manual.

The Half-Tone Process. By Julius Verfasser. Second Edition. London: Percy Lund & Co. Price two shillings.

We have already reviewed this practical manual of the half-tone process. The fact that a second edition is so soon called for is a guarantee of its value.

Messrs. Montgomery, Ward & Co., of 111 Michigan Avenue, Chicago, Ill., send us their illustrated catalogue of photographic apparatus and materials, and, judging from a hasty perusal of its contents, the amateur or professional photographer is well catered for. Practically, everything photographic can be supplied by this firm, which styles itself "Monarchs of the mail order business."

The British Journal Photographic Almanac for 1897. Edited by Thomas Bedding. London: Henry Greenwood & Co.; New York: The Scovill & Adams Co. of New York.

"Bigger and better than ever" must be said about this ever-welcome Annual. The articles are all of practical value, and quite a number of illustrations, by various processes, are scattered through the volume. Many valuable tables are given, several being reprinted from our own Annual, but without credit to that source, a slight mistake that we feel sure the editor will rectify in future editions.

Photographic Mosaics for 1897. Edited and Published by Edward L. Wilson, New York. Price, 50c.

For thirty-three years this little year-book has made its appearance, and we are inclined to believe that the present issue is considerably in advance of its predecessors. Mr. Wilson caters chiefly for the wants of the professional photographers, and no man understands their requirements better than he.

Manual of Photography. By Samuel Reber, First Lieut. Signal Corps, U. S. A. Washington: Government Printing Office.

This handy little manual has been prepared under the supervision of Brigadier-General A. W. Greely, and is intended for the use of the U. S. Army. The author deserves considerable credit for the thoroughness of his work. In a few pages he has condensed a vast quantity of valuable information.

Photograms of '96. Published by Dawbarn & Ward, London. Price, one shilling; cloth, two shillings.

A superb collection of half-tone reproductions of the choicest works exhibited at the recent Salon and Royal Photographic Society. The literary matter accompanying the pictures is from the pens of Gleeson White, Alfred Stieglitz, Josiah Martin, Eldridge Stanton, W. F. Ponder and the staff of the *Photogram*. We advise every student of artistic photography to obtain a copy of this work.



THE FERRY — BY E. MAINWARING

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF NOVEMBER, 1896.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

No. 570,774. Photographic Camera. Frederick H. Sanderson, Cambridge, England.

A pair of swinging arms or cantilevers is provided, each of said arms being formed of two longitudinally slotted members, the ends of which are pivoted at suitable distances apart to a support. The slotted members of each cantilever cross each other, and are designed to receive gudgeons carried by the camera front. These gudgeons have pivotal connection with both of the slotted members, and are secured thereto by binding nuts, whereby the camera front is supported wholly by the said arms and can by adjusted in the fore and aft, and up and down directions and likewise about a horizontal axis.

No. 571,085. Portable Photographic Dark Room. Walter T. Ferguson, Bickley Mills, Va

The inventor forms a portable dark room of a collapsible box or cabinet consisting of a flat bottom board, inwardly folding side boards hinged to opposite side edges of the bottom board, and inwardly folding end boards hinged to the opposite end edges of the bottom boards. These end boards are provided on their opposite end edges with corner cleats having at one end short laterally extending feet. A removable top-board is provided on its underside with a peripheral annular groove adapted to receive the projecting top edges of the side and end boards, and when folded inside of the plane of the sh ort feet of the corner cleats is adapted to rest on the side and end boards.

No. 571,314. Process of Forming Photographic Prints. Sebastien P. Sampolo and Charles L. A. Brasseur, New York, N. Y.

This is an improvement in the art of forming printing surfaces for color printing from photographs from nature A subdivided photographic representation is first made, this representation being composed of differing partial images in side by side areas of the representation Then a separate partial print for and from each partial image is made photographically, after which a printing block surface is produced for and from each partial photo-print.

No. 571,470. Pack of Photographic Films. Joseph T. Clarke, Boston Mass

In carrying ont this invention a pack or series of photographic films of two patterns are provided with opposite notched edges. The films are so formed and arranged in alternate sequence that the notches of the films of odd number in the pack correspond to the projections between the notches of the films of even number, and vice versa.

No. 571,496. Kinetoscope. Adolph Pettenkofer, Brooklyn, N. Y.

A kinetoscope constructed with a stationary block having a sharp angle or shoulder formed thereon, and an endless belt adapted to travel around said block and over said angle, and pictures secured at one end to said tape or belt and extending at an angle therefrom.

No. 571,632. Flash Light Apparatus. Joseph Wolf, Rochester, N. Y.

A powder reservoir is provided with an adjustable bottom and air or gas inlet pipe, a powder exit pipe, a funnel and an igniting device. The inlet and exit pipes communicate directly with the upper surface of the powder so that the latter may be discharged by a blast on its unobstructed surface, and the charge maintained at an approximately constant level.

No. 571,642. Photographic Retoucher. Samuel G Bradford, Benton Harbor, Michigan.

A photographic retouching tool is provided with a tubular handle which is adapted to carry a cylindrical case or housing. A wind motor is mounted on a suitable operating shaft and arranged within said cylindrical casing or housing. A flexible air tube is connected with the latter by means of a nozzle, and eyes or loops are fastened to the handle and designed to embrace said tube. An automatic spring actuated cut-off is adapted to engage the air tube and pinch the same whereby the air passage therein is closed.

No. 571,716. Stereoscope. Hawley C. White, Bennington, Vt.

An eyepiece for stereoscopes is formed of a tubular piece provided with a lens, the end which contacts with the user's face being fitted to the orbit of the eye by having an outer projection fitted to the temple, and an inner projection fitted to enter the sunken depression at the inner corner of the eye beside the nose.

No. 571,806. Camera. Philip K Stern, St. Louis, Mo., assignor to Stern Manfg Co., same place.

A camera is provided with an internal mirror normally inclined at an angle to the optical axis of the same, a focusing screen being set at right angles to the focal plane of the camera. Means are provided for transferring an image from the focusing screen to the focal plane. A shutter is also provided for controlling the exposure of the sensitized material, and a diaphragm stop is arranged normally out of register with the optical axis of the camera and adapted to cooperate with the shutter

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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

FEBRUARY, 1897.

Number 2.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.



THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH ST. NEW YORK.

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THE
PHOTOGRAPHIC TIMES.

VOL. XXIX. FEBRUARY, 1897. No. 2.

AUTOBIOGRAPHICAL SKETCHES.

BY H. P. ROBINSON.

CHAPTER I.

"A sleepy land where under the same wheel
The same old rut would deepen year by year."



ENTRANCE TO LUDLOW CASTLE.

THIS IS an account of the training of one whose faculties, the writer thinks, were suited to the expression of pictorial ideas, so that they may be set forth in any material, and whose chosen vehicle was photography. It is usual in biographies and autobiographies to dwell on the desperate struggles and difficulties with which the hero had to contend before he emerged from the chrysalis state into that of the butterfly; how cruel fate had put obstacles in his way, and how he triumphed after all. This, on the contrary, is the simple history of the early life, until the completion of his first success marks a resting place, of one who sees, like the contented *Duke* in "As You Like It," "good in everything"; who recognizes that all his troubles were blessings in disguise, and is himself astonished on looking back at how the right event happened, the right guide turned up, at the right moment; how even the right inventions and discoveries seemed to come out at the times best suited to the exigencies of his life. And were he a fatalist he could easily distinguish how circumstances have so guided his career as to carefully fit him for the path in life he was destined to follow, little as he himself ever expected to become a photographer. The early scenes lie in a locality at that period so remote and old-world, so reminiscent of Dogberry and Kerges, that he remembers the night-watchman in the streets calling the hour and the weather, and where, even to the present time,

"The curfew tolls the knell of parting day."

When I was asked to write a series of reminiscences I rejected the idea as quite out of the question. There was no precedent. Whoever heard of a photographer having anything to say about himself? What could there be in my experiences of any use to anybody? How could my early struggles be brought to bear on the beginnings of the present-day neophyte? Then it came upon me that in my case it was the early fights with fortune that won the battle, and that the rest of it was simply calling up the reserves to sweep up the spoils. This nearly persuaded me, but there was another contrary consideration. Of all writing the autobiographical is the kind that must be treated most warily, or there would be risk of doing mischief in every line of it, and I am not celebrated for my caution. The period embraced necessarily includes the lives of living men, and I cannot say much about my-

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self without mentioning my contemporaries, and if as the poet tells us :

> "Lives of great men all remind us
> We can make our lives sublime."

it is a fact that many of us do *not* accomplish that remarkable feat, but pass many years of mixed seriousness and frivolity, which, although it may make delightful reading for the multitude, may not be pleasing to one whose youthful jollity was held up to the hilarity of the world, while he himself may now be a churchwarden, a contingency which necessitates probably such retouching to put an ivory polish on perhaps a rather rugged life. Again, if there are shady corners, or, perhaps, even innocent little episodes you would hush up, you, if there is any weakness in you, are allured into becoming imaginative ; in other words, becoming that of which Ferdinand Mendez Pinto was a type ; on the other hand, if you have had a pretty good time, you are tempted to "put on side" and exaggerate and become beautifully expansive. Now, I have been low down, for which I am thankful, and I have been high up—there! an example of bounce comes out at once, almost without me knowing it. This is warning enough to make me consider whether I should go on. I will answer it with, I hope, the last little boast, and say that I attribute such success as I have had to never turning back, and I *have* begun these sketches. I have possessed a Shakespeare ever since my godfather gave me one at my christening, and the first passage I can remember, when I was able to read his wonderful words, was *Polonius's* advice to *Laertis*, too well known to quote.



LUDLOW BY H. P. ROBINSON

Difficulties accumulated. These chapters will be of little interest to many people; they are not full enough of misfortune. Yet another. The events most interesting to me are of no consequence to the world. Who will care to hear about that wonderful 73, made on a soft wicket at a time when great scores were the exception, or that basket of trout caught in a Nor'easter, when there was no expectation of a rise on the water? The way out would, of course, be to rush on to when I took up photography in earnest, but I am strongly of opinion that if these sketches are to be of any value to the student, they will be in the account of how I was *prepared* by all my surroundings to become a photographer for years before I first smelt collodion. It is usually the struggles of a life that provide the lessons. The early part of mine was full of struggles, but also full of what is called the luck that helps effort, and, with all its crosses, full of happiness. Taking a calm look backwards, I think that the episodes I would prefer *not* to have missed are the struggles. The fighting spirit, taken in its best sense, is the most useful a man can have.

But why go on! When you come to think of it, no excuse is required. This is an autobiographical age. Autobiographies of all sorts and conditions of men are the common objects of the library. Why should the dear delights of writing some account of his life be denied the photographer?

Although I never expected to be a photographer, I always hoped to be an artist of some kind, and I have had very definite aims and objects, pursued, I am ready to believe, to successful ends through photography and the narration of the pursuit will, I hope, hurt nobody. Bits here and there may help to cheer the weary student, and I trust the reader will not misconstrue my purpose in speaking frankly of myself and works. I have mentioned luck, or what looked like it, and must have a word on the subject before I go on. I am ready to confess that

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I have had many strokes of luck—sheer, downright good luck, without any help from myself. Luck that never seemed to be in a hurry, but regularly up to time. But whether there is such a thing as luck or not, everybody admits there are turning points in life, and I have been fortunate in my turning points. It may be useful to call attention to them as we go along. And it has always appeared to me that every principal event in my early life, whether it was what appeared to be a great opportunity, or a serious disappointment, tended to compel me, with or without my will, to become a photographer. The drift was always that way. Even apparently slight things have turned out of vast importance, and, as afterwards seen, of great effect on the rudder of my life, and all steered toward photography.

Yet, photography was not ready for me until I was several years out of my teens. It took at least fifteen years to properly prepare me. What I acquired before I touched a camera may be stated shortly here. Besides the scanty school education usual at the time was a good knowledge of the theory and practice of art which was the backbone of everything; a profound love of nature generally and in detail, and nature studies such as geology and botany; business in its manufacturing and commercial phases, and above all, it having been my happy fortune to come into contact early with many cultured people, and famous artists and writers, I gained a confidence in conversing with strangers which is the keynote of a portrait photographer's business. Withal there was a streak of shyness in me that kept me out of mischief. I am still glad that I cannot make the simplest speech, for I don't know where the faculty would have led me. We will now plunge into the middle of things.

I was born, I am told, in the usual way ; there was nothing remarkable about that. The date, the 9th of July, 1830, at Ludlow, in Shropshire, a town about which I have never altered my opinion, that it is the most lovely town in any of the visible worlds. When we had the wonderful gathering of photographers at Ludlow, in 1895, in connection with the Shrewsbury convention, when the Mayor and Corporation, the inhabitants and the weather, all combined to welcome us, and a Member of Parliament to feast us, I heard somebody say that "the best evidence of his good taste Mr. Robinson ever gave was when he selected his birthplace." I think so, too.

Let me go into raptures about my birthplace, and I will let you off a good deal about my birth, and not like Tristram Shandy, keep it for the XXIIId chapter of the third volume.

I will reserve the town for a little, and content myself with saying here that I may truly say I am glad I was born (which everybody cannot be) and that I was born where that event happened, for I consider it an inestimable blessing to have first seen the light amid beautiful scenery. It may also be as well to state that I am the first child of my parents, and though of good family, was not born to what in these wealthy times would be called affluence, a condition which I have for many years considered was the most fortunate that could have happened to me, for it had much to do with fitting me into the particular groove which beneficent evolution seems to have provided for me. We may argue the point thus: Nature evolved photography, trained it up in the way it should go, and fitted it for my use by the time I was old



LUDFORD BRIDGE. BY H. P. ROBINSON

enough to take it up: circumstances arranged matters so that it was impossible for me to follow the usual art of the time; therefore, as some means of artistic expression was imperative to satisfy the irresistible impulse, I took the gift the gods provided, and it proved to be photography, and, I think, adequate. I can honestly say that if the art has been good to me I deserve it, for it has had the greater part of my thoughts ever since I commenced. I found the right niche into which to fit myself; the photographer too often tries to fit himself to a niche which was not meant for him, and without proper preparation.

Now, a word for the paradise into which I was born, and then we will advance more rapidly.

Beauty, picturesqueness and all loveliness are the food of art. In Ludlow these qualities are to be found in perfection. Built on a hill, partly surrounded by two lovely rivers, the Teme and the Corve, the former crossed by many picturesque old weirs, which break the water into streams and ripples, leaving streaks of calm lengths for boating; set in an amphitheatre of near and distant hills, with glimpses of Welsh mountains beyond, I suppose there is not so much beauty confined in so small a space anywhere as in my native town. The town itself, dating from Saxon times, rises around one of the finest medieval castles in England, which, crowning the elevation, composes well with a noble church. There is scarcely a square yard that does not invite the youth, blessed with intuition, to become an artist. Ruin, rock and river, woodland and pasture, call for artistic recognition. And to add to the poetry of the place, here the youthful Milton produced "Comus" and Butler wrote "Hudibras."

However brilliant Ludlow may have been during the days of chivalry, or when it was the court of the Marches of Wales, as far as personal memory goes, it was always a "sleepy town," a great addition to its attraction. There was no railway when I lived there, and people never seemed to leave the town from generation to generation; there was no necessity for holidays; people did not pine for the sea, yet they lived. The train, I am now willing to admit, adds a beauty as it steams along the valley, and the station is judiciously placed as much out of sight as possible. I have had at least two supreme photographic pleasures in my life. I "led" the convention photographers to Ludlow in 1895, and last May I had the gratification of taking a dozen friends, members of the oldest photographic body in the world, The Amateur Photographic Field Club, to the town for a few days, and their unanimity of admiration was wonderful. Mr. Tom Bright took so pictorial a group of a few of us that I give it with this chapter. The charming, old-world-like effect still remains, in spite of a spick and span new town hall, many sizes too big for its surroundings, and the effect of a vast amount of money spent in restoring the church (in the beginning of which I had some hand not now remembered), and in restoring and uglifying Ludford Bridge, once a miracle of picturesqueness, but now, since it has been scraped and cleaned, still a most respectable old bridge, clean shaved and well dressed. I am glad to be able to give an illustration of it as it was of old.

But the beauty of the place and its surroundings were, I am afraid, the only encouragement to art. In the old time Ludlow was quite fifty years behind the rest of the world. Art was not in very good repute, in fact it was looked down upon. I believe I was the only serious art student in the town, and I was alternately encouraged and dissuaded. It was looked upon as a vagabond life, a nice accomplishment for ladies, but not a solid support for men. Very little professional teaching was to be had; most of the inhabitants knew or cared nothing for art. I must make one important exception, that exception fortunately for me, was my mother. She was



THE PHOTOGRAPHIC FIELD CLUB

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full of artistic instincts in advance of her time, and was the recognized authority in all matters of art and taste for the town and neighborhood. This was one of the pieces of luck to which I have so often to refer. Another was that my father was a schoolmaster and a devoted student of Shakespeare. So that my love of literature, as well as art, is accounted for.

Nothing is sent into this world, not even autobiographical sketches, without some good purpose, and in the next chapter I hope to indicate the moral which ought to be very visible, even in the first. I hope to show that a right road, if not a royal road to pictorial photography, may be found in these pages by those who can see, but in doing this I do not want to hold up myself as a bright and shining light. I would have preferred to write the life of another if I could have known as much about it. I only claim hard work and perseverance, such as are open to all, and strong love of the work that always seemed to be before me, however much it may have been hindered by lesser things.

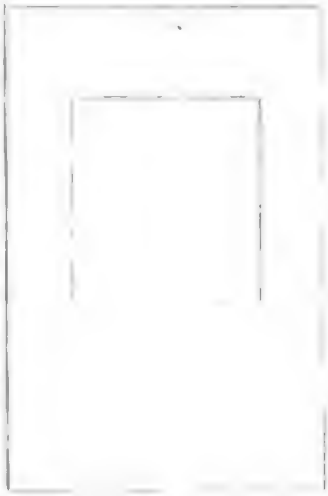
(*To be Continued.*)

THE TWO CHIEF PHOTOGRAPHIC EXHIBITIONS OF THE YEAR.—II. THE SALON. BY HECTOR MACLEAN F.R.P.S., F.G.S., ETC.

FOLLOWING the course adopted with the exhibition of The Royal Photographic Society, I shall—in the absence of any medalled pictures—commence by reviewing the works hung which are of American origin, and shall take them in their catalogue order.

First are a pair of figure subjects from the *atelier* of F. Holland Day, respectively entitled "Beatrice" and "Laura." Of these, preference must be given to the former, which depicts a brunette beauty, whose half-closed, disdainful eyes almost throw a spell over the beholder. The conception, albeit not perhaps to most people an ideal Beatrice, is full of admirable detail; at the same time, it had been better if the somewhat distracting light on the right of the picture were eliminated, which could be easily accomplished with the trimming knife to the great additional gain in the shape of the print which would ensue. Nor is the rusty brown of the proof made the less obtrusive by its green frame.

Besides the foregoing, Mr. Holland Day contributes a portrait (113) which is built up almost entirely of half-tone, a fact needlessly emphasized by being mounted on black *en passe partout*. The claims of erraticism are further acknowledged by the unequal amount of margin at top and bottom. (See figure).



"Laura" is not improved by its tendency to violence of chiaroscuro. None the less, it and "Beatrice" form a telling pair of distinctly *robust* positives

"A Child's Head," by Eugene Lee Ferguson, is in general effect akin to his far happier print at the Royal Photographic Society's Exhibition, than which no more need here be said.

Next we come to the first of Mr. Alfred Stieglitz' four exhibits, which I shall here notice altogether. The foregoing is a well-known open-air portrait of an old gentleman reproduced on Page 169, Vol. XXVIII, of this journal, so is already familiar. Following in

A CORNER OF THE SALON GALLERY ON PRESS DAY



H. P. ROBINSON. F. J. WALL. R. CHILD BAYLEY.
GEO. DAVISON. T. C. HEPWORTH.
CRAIG ANNAN. H. E. DAVIS.

order are, "Gossip," (Katwyk Beach), and "Watching for the Return." Both these belong to the Dutch Longshore species; the people and the scenery have, however, been—as far

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A STIFF BREEZE — BY C. F. INSTON

as England is concerned—thoroughly overdone; otherwise, the fertility of idea and boldness of composition which the above little gems testify to would have attracted much greater attention than has ensued. Mr. Steiglitz' other work, "A Wet Night," is also somewhat unfortunate in that we have lately had rather a plethora of after-dark photographs, culminating this year in Mr. Paul Martin's record set of "London by Gaslight." All said, Mr. Stieglitz is well above the average of the work shown, which, as things are, is no small praise.

Zaida Ben Yusuf is a name that prepares one for something uncommon, which we find this exhibitor's "Portrait" to be. The production belongs to that school of mysticism which loves to give us rather the cue for an imaginative reverie than, as Mr. Maskell so felicitously puts it "to degrade truth to the level of fact." And so we behold a dark, spectral-like form, with a faint, white face, free from all hint of odious detail or obvious verisimilitude such as might offend Mr. Whistler.

Mr. Charles I. Berg treats us to three of his distinctive styles of figure studies, regarding which some admixture of praise and blame must be given. At first sight, and seen from a distance, Mr. Berg's studies strike one as being living forms photographed to represent marble statuary; close inspection, however, destroys the illusion The drapery and attitudes are certainly in a fashion sculpturesque, and the black background, contrasting with the light tones of the skin and robes, helps to make one think of those works of the chisel which the late Canon Kingsley termed "an eternal sleep of snowy stone." But the comely young lady who poses as "Night" is evidently palpitating flesh and blood, and by no means a graven image in crystalline carbonate of lime. It is hardly to be expected that such a figure should bear comparison with a sculptor's creation, for whilst the latter is the outcome of ten thousand thoughts and touches, the former depends very much upon that by no means perfect individual, Mother Nature. It is only right to add that in "Galatea," Mr. Berg has resolutely wrestled with the inherent impossibilities of his task, and has managed to escape from some of the worst faults of what may be not inaptly termed "The Fleshly School of Photography." Respecting "Morning," little need

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"BETTER BE MERRY THAN WISE"
BY WALTER L. MCNAY

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be said—except to wonder why the composition should be so confined for want of space that the frame, with startling abruptness, cuts off one of "Aurora's" shapely arms just above her elbow.

Mr. John E. Dumont's "Village Choir" is a resourceful and inventive "subject" photograph, which, not overstepping the bounds of Nature, gives form to "imagination's airy wing," in so far as it sets back the hands of Time, and introduces us to an interesting old world set of people, who can be easily conceived as varying much psalm-singing with some occasional demure flirtation. The chief drawback pervading the above is that its tonality is "Emasculated." Mr. Dumont will, I know, pardon my thinking this a faulty detail worth the mentioning.

Mr. Henry Troth can never be anything but correct, and admirable as regards execution, but his two landscapes certainly do not impress one so much as do his botanical studies at "The Royal." "The Lonely Shore" is unconventional, which goes for a good deal in the present day, but it does not leave a very enduring mark on the memory.

No American exhibitor is more strongly represented than is Miss Francis B. Johnston. Her "Wind-Swept Sedges," indicate that she is as watchful of the picturesque *en plein air* as in the studio; whilst "Mignon"—despite some weak modelling in the girl's cheek—is an acceptable figure-photograph. Where, however, Miss Johnston's claim to distinction lies is in her thoroughly well-executed picture of "Pepita." It is one of those refreshing productions which are made up of many charms and few defects. The pert model, aided by her quaint and becoming dress, exercises an instant fascination, and, when one stays to examine more closely—which, so heedlessly has the hanging committee treated "Pepita," needs the standing upon a chair—it is remarked that there are many subtleties of artifice which make the print more than commonly perfect; as, for instance, witness the clever, and called for, indication of *contour* given to the bosom by means of the string of pearls.

Having concluded my remarks respecting the American works which have come under my particular notice at the two exhibitions, I cannot refrain from testifying to the great pleasure the close inspection of these samples of Transatlantic photography has given. Taking them *as a whole* they, in some important respects, are more than equal to most of the exhibits; for instance, they are not to the same extent as the English photography "sicklied o'er with the pale cast of" emasculation. On the other hand, they occasionally indicate that their creators are not so familiar with both current and classical art, and photography, as are those who live in the vortex of London or of Paris. To be well up in other people's failures, and familiar with the impossible, is a valuable possession which your exhibitors do not in all cases enjoy.

In treating of the rest of the frames, I shall deal very briefly with the leading lights of England, for to commence with, they and their works are pretty well known to all, and this year there is little that calls for detailed notice. Moreover, I would rather dwell upon certain examples of continental art which are quite as profitable and less trite.

No more fitting name can one begin with than that of Mr. Alfred Maskell, to whose skillful and courteous pilotage the Photographic Salon is, without doubt, indebted for the abiding and growing favor in which it is held by photographers and others. From amongst eight artique prints, "A Dutch Girl" is an easy first, and "sets a standard of value" which many will regard as a sufficiently high one.

After which the deluge—of works which revel "in the gloom of earthquake and eclipse," chief offender being Mr. George Davison. Shall I, therefore, here pen a truthful diatribe upon the sin of photographic falsity, of which he is guilty? No, for space forbids; and, besides, I have elsewhere had my say on these light-forlorn and formless impressions.

Mr. Ralph W. Robinson's works are also more gloomy than pleases me, in spite of which they have passages which compel one's praise; hence the greater the pity that they should lack sparkle. Mr. H. P. Robinson sends three or four landscapes which impress one as being examples of an old style of *motif* decked out in modern guise; they are also rather inclined to be heavy.

Of Mr. A. Horsley Hinton's half a score of studies, which record the picturesque moments of commonplace scenery, one cannot do other than speak highly approving words for the skill evinced in making much imposing and delight-giving effects out of very ordinary materials. It is impossible to describe or analyze the series. Enough that they are mostly subjects taken upon esturine flats on the east coast, the *mise-en-scène* being effected by an abundant use of reeds, weeds, old posts,

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Medalled at the Royal Photographic Society Exhibition.

WAITING FOR THE WIND BY C. F. INSTON

boats and plenty of mud bank. Perhaps, most effective is "Requiem," an old fishing smack resting in a lonely creek at sundown.

What of Mr. J. Craig Annan? Has this strong young man outgrown his strength? By no means, only he seeks to travel just a bit too far. Thus, in "Eleanor," we find an astonishingly daring attempt to realize an imaginative conception after the manner of the preRaphaelites; that we get too much obtrusive detail—where it is not wanted—and, by comparison, too little where it should be; that the whole deals in discords, is hardly to be wondered at. "The Church or the World" is in result not any more satisfactory; it introduces us to a simpering girl, with a somewhat vacuous expression, who sits upon a very dejected circus pony, which is, nevertheless, being held in bondage by two stalwarts in ulsters; why this should be is not very clear, except that darkness has so enveloped the group that there seems some fear of the hired animal being lost in the wood. In "A Lady in White," Mr. Annan treads on firmer ground, and has produced a full-length portrait study which is also a meritorious picture.

Of the remaining English exhibitors, little need be detailed; Mr. E. R. Ashton is strong in Egyptian views, Mr. Lewis Cohen has a fetching "Smile;" Mr. Birchett has personified "Ceres" by means of a most masterly and powerful plate which I would like to "enthuse" over for half a page; even so, I should not forget to add that the young lady's face is most unbecomingly freckled. Of course, there are portraits of the local notabilities of our little village. Most of these are ungainly in attitude; some of them are like enough for a near friend to identify with the sitter. Perhaps, the most striking likeness is that of Mr. J. Gleeson White, by Mr. F. Hollyer. I hope, by the way, that the latter will not consider the foregoing remark offensive; if he be like some of the other exhibitors—that is, judging them by their work—he may think that an excellent portrait should bear no resemblance to the original. Of the rest Messrs. Eustace Calland, J. Fortuné Nott, C. Job, J. Gale and Gay Wilkinson may be mentioned—as also Dr. Hall Edwards whose "Old Honesty" leaves a good impression, and Mr. Walter L. McNay, who makes a first appearance with "Better be Merry than Wise," a

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genre composition which, as may be seen by the accompanying reproduction, is indicative of the possession by the photographer of some æsthetic culture. The notion is one of those pleasant pictorial conceits which, frankly artificial, is grateful, for the many indications it includes of pitfalls evaded, and of thes kilful emphasizing of decorative portions of the composition. If for nothing else, the print would be valued for the opportunity it gives of admiring the two unusually charming types of maidens who masquerade *a la Watteau*. The comparison of this with similarly conceived works by the French exhibitors, such as M. Puyo, referred to later on, will be both interesting and profitable. Thus far, I have said *nothing* of what constitute the most notable features of the collection, namely, the contributions of Continental camerists. This importance is not so much on account of their number, but for their excellence and for their variety of models, conception and procedure. Take C. Puyo, who should be by this time fairly well known to the readers of THE PHOTOGRAPHIC TIMES of New York; refer to the half-tone blocks of his exhibits. What '*chic*' there is in his prints; observe the graceful arrangement of form and line, the adaptation of models to the telling of a suitable pictorial anecdote, and the general preference for beauty rather than ruggedness, for tenderness rather than turgidness. Not only can he perceive and compose, but, having created a pleasing subject, delights to let the beholder see it; in a word, his prints are both lucid and explicit.



OPEN AIR STUDY BY RENÉ LE BEQUE

Then what English exhibitor shows the same wisely directed invention, combined with so large a share of refined truth, as does M. René Le Beque? Consider "Surprise," a strange weird woman who might almost make one credit that poetic myth and imagery are but slightly removed from fact. His examples of "The Altogether," or nearly so, are also commendable, although at times prone to be too prosaic. His "Etude De Nu" has found favor with many; on the other hand, not a few take exception to the "Etude Plein Air" which, being herewith reproduced, the reader may pass his own judgment on.

So far, the foreign exhibitors' works referred to have been silver prints, but those to be presently spoken of are all produced by certain modifications in what is known as the carbon process, to which the names bichromated gum, papiers velours, Artique process, and other titles have been given. This is not the place to dwell upon the technique involved in obtaining prints by the above means; but with the editor's permission, I will give some practical information on the subject in a future communication; enough now that the image is produced, not as with the old carbon process, by first squeegeeing the print on to

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another support, and, after stripping off the original support, developing the image from what was the back of the bichromated gelatine film, but by applying sawdust and warm water direct to the front (without transfer). This method permits of a large range of control over the light and shade of the resulting print. Somuch is the result qualified by the force and direction of the stream of sawdust and water that, even if one tries hard, it is barely possible to get two prints alike from any negative. At least, so we are told. Of course, the above species of bichromated paper has been now some time in use in the form known as *artique;* examples having been displayed both last year and this in the Royal Photographic Society's Exhibition; as witness, Mr. A. Pringle's technically brilliant print in the present display; but those whose works I am about to refer to, have used a modification of the process under consideration in such a fashion as to produce much of the effect seen in crayon drawings. Take Hans Watzek's "Fishing Boats Returning"; here we find a strange similarity to crayon work, which is even more strongly marked in "On the Elbe," an effectively handled *mere* scene in black and gray. As valuable to see is Heinrich Kuhn's "Twilight," which, however, warns one rather emphatically of



MEMORIES OF THE DESERT — BY DR. PAGE MAY



Medalled at the Royal Photographic Society's Exhibition.

NORWICH CATHEDRAL — J. BULBECK & CO

the dangers ahead when using this novel device. Chief of all examples of the peculiar amenities of these bichromated gum productions is Dr. Hugo Henneberg's very striking and painter-like *tour-de-force* "Stormy Weather," in which we see a sullen and gusty atmosphere, dark, wind-swayed trees which seem to rock as we look, and an unkempt foreshore mixed up with weed and water. The ground color of the paper is a kind of French grey; the scudding clouds and the half-tones in the ruffled water, &c., are of a leaden hue, heightened with black, whilst most part of the foliage and foreground is heavily laden with dark sepia. This is, perhaps, of all, best worth seeing, not only as exemplifying photography's protean capacity, but because of its decidedly decorative and sympathetic qualities. Unfortunely, it is impossible to reproduce the original in time for publication with this critique, or I should have arranged that readers had the opportunity of studying this novel application of photographic printing in three tints.

I cannot more fitly close these notes than by alluding to some of the numerous, and not less versatile, "translations" of M. Robert Demachy. I call them "translations" because the language employed is less that of Nature, less of the dry-plate, than of M. Demachy's tasteful and dexterous fingers. Out of his "baker's dozen" of examples, take his "Primavera," a girl's head and torso in Bartolozzi red; here, apart from minor manipulatory assistance, the finishing touches which alone lift it out of the ordinary, are frankly wiped out, or put in, with much knowledge of effect, and to the great pictorial gain of the composition. His "Profile" is even more noticeably hand touched. Turning to his landscape work, the same signs of meddling with the machine-made article are to be recognized. I do not here intend to take this as a text for the danger of tampering with photographic truth, and would only say that with the introduction of the bichromated gum and the allied printing processes, this personal factor in print producing becomes, in a measure, inevitable.

Having particularized, I should like to generalize, and briefly point out how Photography; since—now some fifty years ago,

> "Nature, the old nurse, took
> The child upon her knee,
> Saying, 'Here is a story book
> Thy Father has written for thee.'"

has, after much toil and blundering, learnt to spell out a good deal of the beauty in form which everywhere awaits appreciation; but those stern monitors Time and Space forbid me.

THE SCIENCE OF PHOTOGRAPHY. BY CHAPMAN JONES.

THERE has been a great deal of truth talked lately about the making of pictures by photography, and the desirability of the study of the principles of art; and we would not say one word against either, but we would remind our readers that the making of pictures is not the sole aim of photography. Indeed we may go further and say that "picture making" describes only a small section in the practice of photography and is probably that section that we could dispense with at the least cost. There are many other ways of making pictures which in the hands of the skillful offer far greater possibilities, more variety, and fewer restrictions. But in probably every other of its applications photographic methods have supplanted other methods on the principle of the natural process of the survival of the fittest.

As a scientific recorder in astromomical, spectroscopical, and microscopical investigations, photography is not only better than visual observations within the limits common to both, but it has a far greater scope than the latter and is generally very much more sensitive. We can find photographically what we cannot hope to see even with the best of aids. In commercial portraiture what can be better than photography? It is cheaper and even at its worst far better than the attempts at cheap portraiture that preceded it. In the copying of pictures, photography provides us with methods that are cheaper and more rapid than any others, and that give more truthful and pleasing results. Photogravure is taking the place of copper and steel engraving, not only because it is cheaper but because it is better.

But if we consider pictures that are only pictures, those that are not portraits and that have no local interest, figure pieces the originals of which are unknown to us, and pictures of places that the artist would consider it beneath his dignity to tell us the locality of, pictures that must be judged of solely and only as pictures, these are not made by photography because the photographic method is better than any other. It may be because it is cheaper

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"'TWIXT DAY AND NIGHT" BY JOHN H. GEAR, F.R.P.S.

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and easier to practice, but not because it is better. The making of these abstract pictures (if we may be allowed the term) appears to be the one application of photography in which it cannot hope to excel, and in many cases even to rival, the alternative methods.

It must not be thought that we are seeking to belittle artistic photography; on the contrary, we want more of it, if only the muddy flats and evening effects were not so very numerous, but it ought to be recognized that this section of photography is really an exceedingly small one. When one of its champions tells us what he wants, or what photography from his point of view stands in need of, he is no more entitled or able to speak on behalf of photography in general than the monarch of one small nation is to speak on behalf of the whole world. Moreover, these gentlemen must not be regarded as leaders in photography, but only as leaders in picture making by photography—a very different matter. Though they may do rather more than this, if they are willing to show us how to make portraits and views of local interest, portraits and views that are taken for the sake of the interest attaching to the persons and places that they represent, more pleasing to the cultured eye, or in other words, more artistic.

Photography is the recording science, and its records should first of all be truthful and secondly, pleasing.

Our artistic friends are doing, we think, a noble and more useful work when they are helping to make its records pleasing, than when they are making pictures of places that are nowhere in particular. But when they get a negative and put as much hand work upon it as they can "without detection," for this is actually the limit that some adopt, then whatever the result we hold that they are degrading photography if they exhibit their goods as photographs. That they are pleasing to the eye has nothing to do with it. A fraudulent rich man may wear a respectable coat and appear handsome and good, but he is more to be despised than the dishonest beggar. Every one is free to make pictures by any method or combination of methods that he likes, but if he exhibits as a photograph a thing that is not a photograph, he injures photography to an extent that he can never estimate.

Photography, as we have said, is the recorder, and it is only in this character that it is strong. To make the most of ourselves we properly cultivate especially, the best powers we have. To make the most of any art or any science, we must apply it to those matters that it is best able to serve. Any of us would rather have a pure and simple photographic record of Shakespeare or Homer than the finest painted picture of them that any one would have been able to produce. If we could imagine that the practice of photography were to cease now forever, its application to the making of abstract pictures would soon be forgotten, but it would ever be remembered as the most perfect recorder known. Let, therefore, those who take the slightest interest in the science of photography, or in its application to the registration of facts, cultivate this side of photography with the certain knowledge that it is its strongest side. And if the record is of a face, a building, or a place, let it above all things be true, but let it also be presented in as pleasing (that is, artistic) a manner as the circumstances permit.

COPYRIGHT AND REPRODUCTION. BY WALTER SPRANGE.

The existing conditions governing the right to obtain the copyright of a photograph or a reproduction of one in the United States, and in those foreign countries with which it has reciprocal copyright agreements, seem to be very vaguely understood, and to have received but little attention in the columns of photographic publications.

The detail of the requirements necessary to have the title of a photograph or a reproduction of one recorded, and of obtaining a certificate of such record, can best be ascertained by writing to the Librarian of Congress, Washington, D. C., for a blank form of application for the copyright of a photograph, and it will be furnished free of cost.

Briefly stated—it is necessary to have a separate title of each engraving, cut, print, photograph, or chromo, printed (typewritten letters will be accepted) on paper as large as commercial note, and to forward it to the Librarian of Congress, Washington, D. C.—on or before the day of publication, with a fee of fifty cents (postage stamps will not be accepted)—for recording—if the applicant resides in the United States: or, of one dollar for persons residing out of the United States. Certificates of the record will be furnished (if

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desired) for an additional fee of fifty cents each. Two copies of the photograph or reproduction, mounted, at least as large as cabinet size, should accompany the application; but can be forwarded on or before the day of its publication. And one copy of any new issue—wherein minor charges are made—must also be forwarded. Each print, or its mount, must bear the words "Copyright, 18—(year), by—(name)."

The applicant must (be able to) state that the negative from which the photograph or reproduction is made is of American manufacture; whether he (or she) is the author, designer, or proprietor; and must give full name and address.

In order to sustain a copyright after the certificate of record is issued, the photograph must embrace an original conception (arrangement, subject, lighting, etc.) and, in portraiture, the copyright belongs to the person photographed, if it has been taken by a professional photographer and the usual charges have been paid in the ordinary routine of business.

If any material change is made (in title, design, background, etc.) a fresh application must be filed, and two copies of the photograph or reproduction forwarded to the Librarian of Congress—as before.



GOSSIP BY CARL WOLFF



NO FLIES ON ME BY CARL WOLFF

An applicant for copyright must be either author, designer, or proprietor; but copyrights are assignable by any instrument in writing, if recorded in the office of the Librarian of Congress within sixty days from its execution. The fee for the record and certificate is one dollar, and for subsequent certificates one dollar each.

The requirements that a separate application must be made for each title, and that the applicant must be either author, designer, or proprietor, seem to be prime essentials which are not carefully observed by a large class who make claim to the copyright of reproductions produced by them.

The requirement that the prints shall be made from negatives of American manufacture, absolutely prevents the copyright of any print made from negatives of foreign make, hence American camerists visiting foreign countries must carry American dry-plates or films for all photographs they desire to copyright in the United States, and, under the International Copyright Laws; the conditions upon which copyright

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certificates are issued in those foreign countries with which the United States has reciprocal relations, are precisely the same; so that, in order to sustain a copyright claim abroad, the negative from which the photograph is made must have been manufactured in each of the countries in which the copyright certificate has been issued.

Copyright certificates are issued regardless of many conditions, of which no inquiry is made, leaving the value of the holder's right to actual facts. Many of the copyright certificates issued abroad upon prints filed by foreign applicants are of very doubtful value; and, if the prints have been made from negatives of American manufacture, the copyright could not be sustained.

It is very doubtful if any of the foreign reproductions sold to and used by publishers in this country, even those sold by the so-called sole American agents of the owners of them, who claim the foreign copyrights of originals, have any exclusive copyright to these reproductions. There are many European reproductions—of the works of the old masters, for instance, sold in this country by agencies which claim copyright; but could not sustain the claim—even if their negatives (for half-tone plates) are of American manufacture; because the original conception is not their's, nor has it been legally assigned to them; such works, in many instances, are owned by National Institutions, and permission to photograph them may be obtained, upon request, by almost any one; no exclusive right to reproduce being granted.

The demand for illustrations for periodical publications is now so imperative that almost every possible device is exercised by the publishers of them to secure original prints. The photographic journals, almost all of which now contain illustrations, originated various plans for obtaining prints for reproduction, which also serve the purpose of stimulating practical workers to excel, and of affording object lessons to the fraternity; all which is entirely within the sphere of photographic journalism, and has been conducted with extreme courtesy and a punctilious regard to promises made. The feature of reproducing the works of both the amateur and the professional photographer, showing the progress that is being made in both classes of work; the individual characteristics of known workers; traits of subject and scenery; advance in photographic art; its aid to science; practical descriptive drawings; and so on; are of extreme value to all classes of workers, and receives, as it should, cordial support from the fraternity, regardless of any ulterior reward.

Many of the illustrated magazines and other publications have since instituted competitions, inviting amateurs to contribute prints from their best negatives, the recompense promised being in the form of awards; dates being given for the final distribution of prizes; and, in most instances the promises have been fulfilled; but, in others they have not; the omissions have not, perhaps, exceeded the usual average of unfulfilled promises that one must expect to meet with in all such undertakings. There are, however, certain acts of courtesy extended by some publishers which are entirely omitted by others, and which deserve attention. It would seem as if the amateur—who goes to the trouble and expense of making and mailing prints free of cost to the publisher—is entitled to an acknowedgment of their receipt, and to their return (free of cost) if not accepted. The system adopted by the *Youth's Companion* during its recent competitions, of acknowledging the receipt of all prints on a postal card, should be adopted by all; it would cost but little, and would certainly redound to the publisher's benefit in the end.

The practice of returning prints which are not made use of, should also be adopted by all—in justice to the amateur, and would also result to the advantage of publishers generally, because they all seem to desire original subjects, and amateurs could submit prints from several different negatives for selection—if they were assured that the rejected ones would be returned; but, without such return of them, they are very often at a loss to know which of their prints have been accepted, and consequently thereafter send those of least value—if they send any.

As far as copyright value is concerned, the amateur should make application for a copyright record of the title of all prints of value before parting with one of them; the process is simple and inexpensive; and, while one print is being made to send to the publisher, two more should be made to send to the Librarian of Congress before the first one is mailed, otherwise, having parted with one print, the copyright is lost. The claim made by many publishers that the copyright of a print sent to them, either for competition or for reproduction, belongs to them if they have had a plate made from it, is entirely untenable. They have no copyright claim to it, and if the maker of the

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negative has not made an application for a record of the title and filed two prints from it, before the publication appears, the copyright is lost to all parties.

A separate title must be filed for each engraving, cut, print, photograph, or chromo; therefore the general copyright of a publication does not entitle the publisher to the copyright of its illustrations; and, in the instance of the work of amateurs sent to the publisher in the manner described, the latter has not one tittle of claim, either as author, designer, or proprietor; as a rule, the publisher does not possess the negative, does not know whether it is of American manufacture or not; whether any prints have been circulated before he received one; and has no written assignment; and, even if he had one, a separate title and two copies of the print must have been filed before a single copy had passed from the maker's hands.

The practice of those publishers, who, having obtained prints for reproduction in their publication free of cost, and having wrongfully claimed the copyright to the plates made from them; afterwards offer electrotypes from the plates on the market for advertising purposes, seems to be worthy of notice in this article. It is possible that no objection may be offered if the subject is of a general character, such as a landscape or a marine view; but if portraits are included, it might prove to be very annoying to the sitters to find that portraits of themselves, taken perhaps as art or figure studies, have been utilized in this manner.

There are many excellent opportunities offered to amateurs to contribute their happiest results to the pages of publications entirely devoted to the art science, and also of other publications that include amateur photography in their columns, the editors or publishers of which will courteously acknowledge the receipt of prints, either by direct communication or in the columns of their publication; will notify the sender which photographs sent to them have been selected for reproduction, and will return those not wanted: will make no proprietory claim to the productions; and will forward a copy of the publication containing the reproduction as soon as it is issued. And, with such usage, it is a pleasure to respond to the request for prints. On the other hand, considering the time, labor, and expense, involved in furnishing prints to publishers free of cost, it would be a good rule to avoid furnishing them to those who do not exercise the above courtesies, or, indeed, recognize that any obligation has been incurred by them; and especially to show the "cold shoulder" to those who undertake to avail themselves of the average amateur's ignorance of the existing copyright laws, by claiming that having made a plate from the print sent to them, the copyright to it belongs to them, for they know better than that!

International copyright relations with the United States exist with Great Britain, France, Germany, Italy, Spain, Portugal, Belgium, and Switzerland. Copyright certificates are issued abroad only on receipt of the finished work on day of publication—which must be simultaneous in all countries. No certificates are issued for the titles of contemplated works in any of these countries.

A FURTHER COMPARISON OF VARIOUS MAKES OF COMMERCIAL ORTHOCHROMATIC PLATES THROUGH YELLOW COLOR SCREEN. BY STEPHEN H. HORGAN.

A RECENT article of mine, giving the results of a search for a true orthochromatic plate, has been raised to an unexpected importance by the ridiculous criticism heaped upon it in so many of the photographic journals. *Anthony's Bulletin*, on page 432, of the December issue, reviews this criticism as a disinterested observer, but in such a concise and conclusive way, that it is reproduced here by way of reply to that criticism:

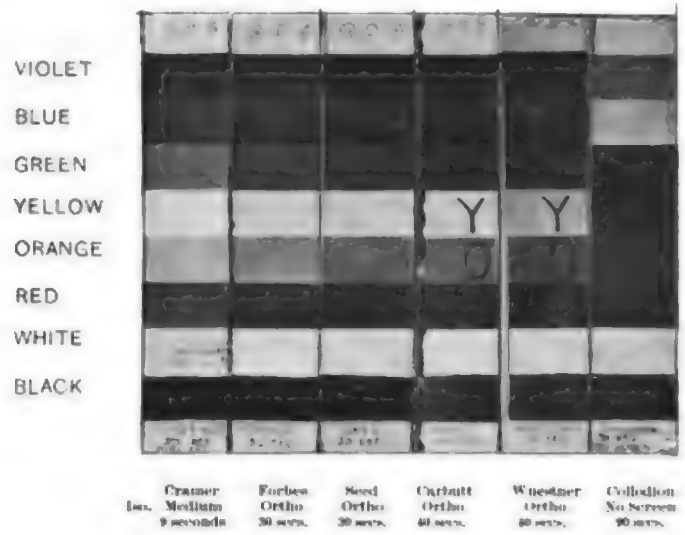
"Many hysterical articles by parties interested in various makes of dry plates are being published by some of our smaller contemporaries. The critics in every case apparently have not read the original article on 'Commercial Orthochromatic Plates Without Color Screens' with the care that a critic should employ. Epithets and unfounded accusations are not arguments, and we have yet to learn that the facts as stated are incorrect. As we take it, a certain number of experiments were made with certain plates under certain conditions, and the results were published. These results have not been confirmed nor have we seen an 'illustrated' denial. The publication of this paper was timely, and should lead to a calm discussion of the merits and methods of using so-called orthochromatic plates. Rash assertions against demonstrated facts is the way the case now stands."

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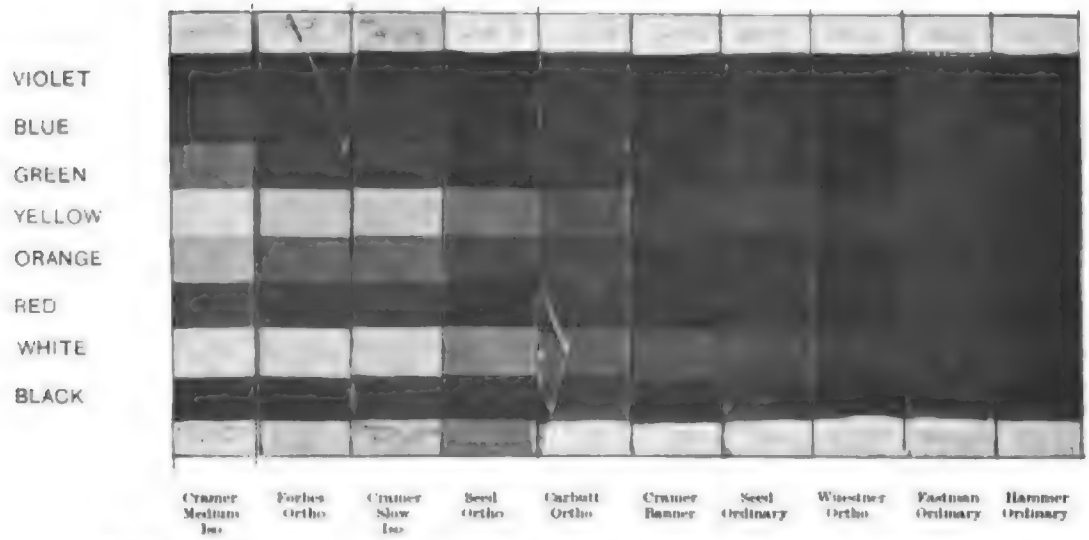
The surprising lack of knowledge on the subject of orthochromatic plates shown by these critics would clearly indicate that there was need for just such an article. With the reader's permission, how the first paper came to be written may not be out of place here.

I had devised a method of making from water-color drawings color blocks for the rapid printing press. This process required four color selective negatives, one of them to be a perfect orthochromatic negative. Meeting the Editor of THE PHOTOGRAPHIC TIMES, I mentioned the unexpected trouble I had in getting true orthochromatic results. It was suggested that the researches would be interesting to publish. Then the comparative tests of all the orthochromatic plates to be found in the market were made. It required forty-two exposures on the color chart before the ten properly-timed negatives were secured from which cuts were published. These experiments were conducted during the middle hours of three days. The light being variable, the lengths of exposure for each plate were omitted because they would be misleading.

Herewith are shown the results of some further comparative tests, this time with a yellow color screen. It is not expected that the conditions under which they were made will meet the approval of interested critics They are recorded here, however, with confidence, that the users of orthochromatic plates will at least see that there was a conscientious en-



THE VARYING EXPOSURES REQUIRED THROUGH YELLOW COLOR SCREEN TO APPROACH ORTHOCHROMATIC RESULTS WITH FIVE MAKES OF ORTHOCHROMATIC PLATES.



SIX SECOND EXPOSURES, THROUGH YELLOW COLOR SCREEN, ON SIX BRANDS OF ORTHOCHROMATIC PLATES AND FOUR MAKES OF ORDINARY PLATES.

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deavor made to learn more of the properties of commercial orthochromatic plates. It should be needless to add, that I have no interest in any brand of dry plate. I am not even acquainted with the makers of them, with the exception of Mr. Carbutt; I know little, and care less, of their methods of manufacture, but I am anxious to find out if there is any difference between the various orthochromatic plates, and share with my brother photographers the information obtained. "If that be treason, make the most of it!"

Mr. Edward Bierstadt, the pioneer experimentor with orthochromatic plates in America, together with Mr. R. D. Gray, kindly assisted me in these experiments. Mr. Gray is the lens maker who has brought color photography to such perfection that he has visited the choicest spots in this country and Europe, securing through his camera three-color records of the various scenes, and from these negatives makes slides that in a triple lantern reproduce all the colors of nature. He also from the same negatives produces three-color printing blocks.

The material and apparatus used were the following: The various brands of plates were purchased at the stock houses three months previously, with the exception of the Forbes' and Seed's orthochromatic. Plates from the Lumiere series B, and Forbes' boxes purchased three months before proved not to possess keeping qualities. All the other plates were in good condition. The color chart was an artificial spectrum with Prang's standard colored papers. This chart was illuminated with two of J. B. Colt's arc focusing lamps on a 110 volt circuit, using about 23 amperes of current. The color screen employed was a Bausch and Lomb cell filled with their standard chromate of potash solution. To record the time a standard pendulum beating exact seconds was employed. The lens was a Hermagis aplanatic No. 6, with stop *f*55. Fresh developer was used on each plate, made up as follows:—

Water	5 ozs.
Sulphite soda	160 grains.
Carbonate soda	80 grains.
Pyrogallic acid	10 grains.

Now as to the method of operation: For the speed test with color screen—one plate of each brand was taken from its box in an absolutely perfect dark room. Mr. Bierstadt wrote the maker's name on each plate together with his own signature. These signed, plates were then put together in a box from which they were taken singly for the speed test. Mr. Gray made the exposures, giving three, six, nine and twelve seconds, four exposures on each plate. I then developed them, striving in each case to get all the detail possible in the negative. The light being so weak in the dark room, there was no way of distinguishing one plate from another until they were fixed and washed.

When the negatives were dry, Mr. Gray determined that six seconds was the proper exposure for comparison sake, so the brand and the time "six sec." was scratched on that section of each negative. Mr. Gray finding that these marks agreed with Mr. Bierstadt's, written on each plate before exposure, certified to it by etching his initials R. D. G on the other end of each six-second section. These sections were then cut from each negative (with a poor glass cutter) and secured by Canada balsam to a plate of glass. A print from this composite negative is reproduced herewith.

It should be said that it was unjust to the Cramer "Banner," Seed 26, Eastman Rapid and Hammer "Extra Fast" to compare them with the other plates sold as orthochromatic. This was done for the benefit of some of my critics to claim that any plate can be made orthochromatic with the aid of a color screen.

For the other experiments, the same methods were employed; Mr. Gray signed the plates before use and also timed the exposures, certifying to their correctness with his initials as before, the editor of one of the photographic journals being present.

To the ultra-scientific critic who will maintain that a prismatic spectrum should be used, it might be answered that the practical user of orthochromatic plate, does not photograph spectrums or rainbows for his living. The Bausch and Lomb color screen with its standard chromatic solution cannot be taken exception to. The J. B. Colt arc lamps give the steadiest light the writer has found in some twelve years' employment of such lights. To the critics who will claim that a special developer should be used with each brand of plate, it might be asked if they know of a developer that has color selective properties, that will develop, for instance, the yellows in a picture and hold back the blues. Taken altogether the unprejudiced must admit that, of these comparative tests, conditions were sought for that would be as fair to one as to the other.

The conclusions arrived at through these experiments are: As shown by the first article,

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there is but one brand of plate that approaches true orthochromatic qualities without a yellow color screen. These later experiments demonstrate a fact which should never be lost sight of in considering orthochromatic plates, and that is: *The speed of a true orthochromatic plate, being super-sensitive to yellow, is reduced but little through the use of a yellow color screen, while the same screen becomes a serious obstacle to the speed of a plate that is not orthochromatic.*

PURE BLACK TONES ON COLLODION PAPER. BY T. VON NORATH.

IMITATION platinum prints on matt collodion (chloride of silver collodion) paper are, as is well known, quite the style at the present time, and there is a continual effort to produce the best possible in this line.

Now, according to our experiments, it is not easy to produce a pleasing black tone on collodion paper even when the directions of the manufacturer of the paper are closely followed. The tone obtained is often either brownish black or blue black. A pure black is seldom obtainable. I have thoroughly investigated the question of the production of a pure black tone on collodion paper and have arrived at the following conclusions.

It is much easier to obtain a pure black tone with a gold bath than with a platinum bath, though it is possible to do so with the latter. When toned with gold, the blacks are obtained with certainty only with the use of the sulpho-cyanide gold bath. It is a question of some importance, however, which sulpho-cyanide bath is employed. Experiment has shown that the gold bath recommended by C. Bühler for his mignon paper is especially suitable for producing the black tones. This bath tones rapidly owing to the fact that the solutions are heated to 78 degs. C. and mixed as soon as cooled. The chemical combination which takes place thereby is different from that where solutions simply prepared cold are mixed. When the toning is carried sufficiently far with this bath, absolutely pure blacks are obtained even in the half-tones of the picture. For ordinary cases, and also where the tone may border on bluish, it suffices to use a cold prepared bath composed of sulpho-cyanide and chloride of gold; further additions are not to be recommended.

If it is desired to obtain black tones on collodion paper by means of a gold bath and a roundabout though certain method, the process is as follows: The prints are toned first in a simple toning bath, which gives an intense brown (sepia) tone. Such a bath may be prepared by adding to an eight to ten per cent. solution of magnesium chloride, a small quantity of a one per cent. solution of chloride of gold. The toned prints are fixed and washed a few minutes and then treated with a simple sulpho-cyanide gold bath. Since the operator has the final tone always under his eye, the process is absolutely certain. For easy and certain toning with the platinum bath, the following must be observed:

First, for toning, only chloride of platinum should be used.

Second, the bath should be as strong as possible, so that the toning process is ended in three to four minutes.

Third, a mineral acid should not be used, but ordinary vinegar or acetic acid.

If a weak bath is employed, the result will be all possible tones except black. Platinum toning is especially suitable for collodion paper when it contains much citrate or tartarate of silver, and which shows itself by the strong red color of the prints. On the same ground, fuming collodion paper which is to be toned with platinum, with ammonia, is to be avoided. Poorly toned prints, which do not take pure black tones in the toning bath, may be very much improved, if, after fixing and washing, they are treated with a sulpho-cyanide gold bath. A combined fixing and toning bath is not recommended, since the black tone obtained is not due to a deposit of gold, but to sulphurization, whereby the durability of the prints must greatly suffer. It is evident for prints which are to be toned to black, white paper should be used, since otherwise the tint of the paper is always visible in the half tones.

"IN all picture compositions the thought should take the first place, and all else be regarded as the language which is to give it expression."—*O. G. Rejlander, Artist and Photographer.*

"TELL your story, describe your scene, express your sentiments, or display your learning in words, but do not attempt to do so in a language with which you have made yourself imperfectly acquainted."—*C. R. Leslie, R.A.*

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IMPROVEMENT IN LENSES. BY MAXIMILIAN TOCH.

For ten years or more manufacturers of dry plates have been striving to make gelatine emulsion more and more sensitive, until we now have plates bearing names like "Cyclone," etc., indicative of extreme rapidity. The rapid rectilinear or symmetrical type of lens has been made to serve the purpose of the view photographer for many years, and while one lens manufacturer may have used better glass than another, or may have had a clearer balsam or a higher refractive cement for combining the lenses than his competitor, the average was fairly good and fairly rapid. The symmetrical view lenses were nearly all of long focus, and those of short focus suffered from spherical aberration so that they had to be stopped down to a degree which made the exposure very long. Lately a new lens has appeared which I confess is remarkable, and many manufacturers produce it under the name of anastigmats or some such alliterative, contradictory term. The lens, though, is better than the name, and once seen produces a desire which is only satiated by possession. The majority of these lenses are composed of two series, each containing three lenses cemented together, and each of these three lenses has a different refractive index; this I state on supposition and belief. One manufacturer makes a lens composed of two series of different foci, each series composed of four lenses, and though the glass is of such composition that the lenses contain minute air bubbles, it appears impracticable to grind out the air bubbles without producing striæ.

It seems that nature reverses itself and that the eight lenses let in more light than the six, and the six more than the four, although it would appear natural that the simple achromatic containing the least glass would let in more light than the rapid rectilinear. This, however, is not so, and the new lens of eight combinations is extremely rapid. The illustration entitled "My Daughter Elaine," was taken on a cloudy day late in the afternoon in 1/25 of a second *f*/7, and no plate in my hands came up more evenly and more fully timed than the first picture I ever took with the new lens. The subject was ten feet from my camera, and the perpendicular plane in which she stood is equally sharp all over. The subject herself is one of those restless youngsters, so mercurial



MY DAUGHTER ELAINE. BY M. TOCH.

in her actions that her father might have been a disciple or a descendant of Hermes.

Since this picture was taken I have taken a large variety of satisfactory views so unlike the "rapid rectilinear" pictures that I would like to prophesy that as soon as the newer lens will be sold at a price within the reach of those who have the rapid rectilinear style of lens, so soon will the rapid rectilinear disappear almost entirely. The newer lens is more like the human eye than any lens made so far. It is from 70 to 90 degs. in angle, and the old rapid rectilinear was very much less than that. It is universally sharp in a given plane, and always sharp beyond 50 to 150 feet from the camera according to the depth of focus.

By a decree of the minister of public instruction of the 29th of January, 1896, M. Hugo Hinterberger has been directed to read lectures on photography in the University of Vienna, Austria. M. H. Hinterberger has studied in the Imperial School of Photography at Vienna, and has published some interesting essays on microphotography and sensitometry. By this means the study of photography has been officially introduced into the programmes of the University.

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FACTS ABOUT LENSES. BY W. ETHELBERT HENRY.*

No part of his outfit puzzles the average photographer so much as the lens, and ignorance of some of its simplest properties exists even amongst advanced workers. This seems to be because the elementary principles have not been carefully explained, and because the meaning of a few technical terms has not been learned.

There is a great deal of "superstition" about the lens, and many fallacies are believed about it; but its operations are based on the unchangeable laws of the universe, and the first of these is that "like causes, acting under like conditions, produce like effects." If photographers would always realize this, they would meet fewer difficulties.

To understand the principles of the lens it is well to do a little experimenting with a pin-hole; for the fundamental laws are the same in both cases.

Take your camera, screw out the lens and put in its place a piece of tin or fine cardboard through which you have made a hole with a fine bradawl or a darning needle. Go into a fairly dark room and place a lighted candle with the centre of its flame three inches from the hole (which we will now call a pin-hole). Adjust your camera so that the ground-glass screen is three inches from the pin-hole, and you will be able to see on the screen an image of the candle-flame exactly the same size as the original flame, but inverted. Why is it inverted? Because light proceeds in a straight line (Fig. 1);



FIG 1

and cannot work round corners (Fig. 2).



FIG 2.

If this is not clear at once; think it over until it becomes so. Then remember it is a *law*, applying to church steeples and maiden aunts as well as to candle-flames, and that this is the reason why the lens image is inverted—no witchcraft about the lens.

Let us now put our candle in a lantern or behind a piece of tin or cardboard having an opening an inch square, covered with a piece of ground-glass or waxed paper. When this illuminated square is placed opposite the pin-hole and three inches distant, it will throw upon the ground-glass screen, if that is also three inches distant, an image exactly 1 inch square. Why is it exactly one inch square? Because light travels in straight lines, thus:



FIG 3

and not in bent lines, thus:



FIG 4.

or thus:

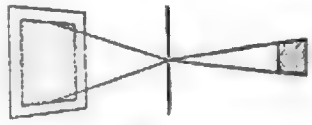


FIG 5

If we now move the ground-glass screen to six inches distance we shall find that it bears an image occupying four square inches, or two inches by two. The reason seems obvious, for we double both the length and the breadth of the image. We shall observe, moreover, that the image in this case is much less bright than it was in the previous case (Fig. 3).

In fact, it is exactly one-fourth the brilliancy, and for a very simple reason. We have done nothing to increase the amount of light passing through the pin-hole; but we have made it

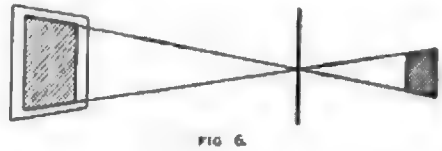


FIG 6.

cover four times as much space. This applies with lenses also, and is the basis of one of the most valuable but least understood of all the laws relating to lens work. Let us return to our naked candle-flame; still leaving it three inches, and the ground-glass six inches from the pin-hole, and we shall see that the image of the candle-flame is just twice as long and twice

* Early work on Photography. London: Dawbarn & Ward.

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as broad as when the ground-glass was three inches distant. It is also just one-fourth the brilliancy of the former im-ge.



FIG 7

Let us now move the candle-flame to a distance above the pin-hole; still keeping it three inches from the front of the camera. The image will fall toward the edge of the ground-glass, instead of in the centre, and we shall notice that the image looks longer and narrower

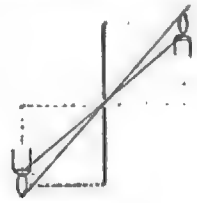


FIG 8

on the ground-glass than it would appear if viewed by the eye placed at the position which the ground-glass occupies. The reason for this is the angle at which the image falls upon the ground-glass surface, and in order to obtain an image more truly approximating what the eye would see, we might have the ground-glass curved, as shown by the dotted lines. But better still if we can remove the candle to six inches, and the ground-glass to six inches from the pin-hole. This will give us the image in the same relative position on the ground-glass, and of (approximately) the same size, but in better proportion.

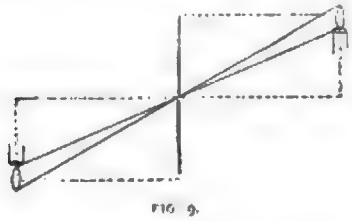


FIG 9.

Suppose now, in place of the very small pin-hole in a very thin card, we take a hole one-eighth of an inch in diameter in a card one-eighth of an inch thick. The rays from a candle placed at *A* will pass through easily. If we remove the candle to *B*, only a small pencil of rays will pass through, while by moving the candle to *C* we prevent any rays from passing through, because no straight line from *C* can pass through the hole.

If we now make the pin-hole considerably larger, say, a quarter inch diameter, we shall find the image on the ground-glass much more brilliant, but much worse defined. This is simply because light rays from the candle proceed in all directions, and while the rays proceeding through the centre of the pin-hole are making a definite image, those passing through

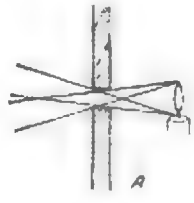


FIG 10

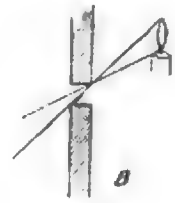


FIG 11

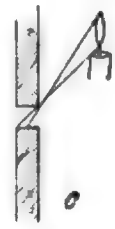


FIG 12

the upper part of the hole are making another, while those passing through the bottom and the sides of the hole are all making their own images, and the result is confusion.



FIG 13

As the hole is further enlarged, the image constantly becomes brighter, and constantly more indistinct until it is simply a circular patch of light, with no resemblance to the shape of the candle flame. This would, perhaps, be more easily understood if, instead of the one large hole, four or five pin-holes are made at about a quarter inch distance from a common center. The blurring of the image will be seen easily; and the large hole acts as an infinite number of smaller ones.

If we return to our original small pin-hole and take the camera out of doors, we shall find that an image of any fairly lighted natural object toward which the pin hole is directed will fall (in an inverted position) upon the ground glass. If we cover our heads and the back of the camera with the focusing cloth we shall see that the image, though faintly illuminated, is

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clear and sharp, and if we expose a sensitive plate to this image, an impression is made which can be developed into a negative. But the amount of light passing through the pin-hole is so small that it must act for a long time (*i.e.*, we must give a long "exposure") in order to make a strong impression. But in photography we must face the fact that we wish to make our exposures as short as possible, especially when the objects to be photographed are in motion (say, express trains or unruly children). This brings us to the problem which led to the use of lenses in photography—the desire to use a big hole, in order to pass plenty of light, com-

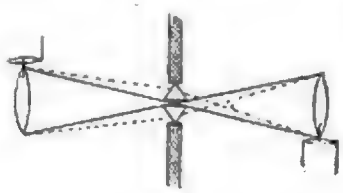


FIG 14.

bined with the necessity of keeping the image "sharp" and well defined

The lack of sharpness when the rays passed through the large hole, was seen to be due to the want of coincidence between the images formed by the rays passing through the sides, and those through the centre of the hole. We need, therefore, some means of causing the images formed by the outer rays to fall on the same spot as those formed by the rays passing through the centre. In other words, we want a means to bend slightly inward the outer set of images. The bending of the rays of light is usually accomplished by reflection or refraction, and in camera work the latter is found more convenient. When light passes from a medium of given density into one of different density, its rays are bent or refracted, and a simple example of this is found in the use of a prism. Suppose, therefore, we make our pin-hole much larger than before, allow the centre to be open for the central rays to pass and fill the upper and lower

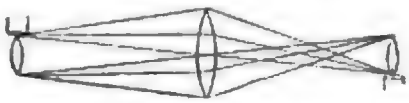


FIG. 15.

part with prisms, what will happen? (Fig. 14.)

The central rays of light will pass through the centre, as before, while those through the top will be bent (or refracted) downward, and those through the bottom will be bent upward, so that the three images coincide on the ground glass. We shall need another prism at the right-hand side, and one at the left-hand side of the hole, to refract the rays from those directions, and then, as four straight lines will not fill a circle, we shall need other prisms in corners between those already placed. In fact, we need an infinite number of prisms, arranged round a common centre, and this is simply a lens in primary form (fig. 15).

This form of lens has two main defects—its pictures suffer from spherical and chromatic aberration, the nature of which we will attempt to explain, first taking chromatic aberration.

If all the rays were of one color, and therefore equally refrangible (*i.e.*, equally capable of being bent) this simple lens would answer many purposes, but we know when a thin beam of light is passed through a prism the rays are divided according to their refrangibility, and instead of getting a spot of light where the rays from the prism fall, we get a long vari-colored strip of light—a spectrum. The same thing occurs with the lens, for all light is composite in its character, and its violet rays, which are more refrangible than the yellow, will be focused, and will give a sharp image at a point nearer the lens. As the violet light rays which are dark to the eye are those which are most active photographically, while the yellow light rays (brightest to the eye) are least active, we find that we have here two foci (explained later), one called the visual, and the other the chemical or actinic focus. If we place our ground glass screen (or later our sensitive plate) at the point where the visual image is strongest and sharpest, we shall find on developing the photographic image, that it is feeble and blurred. If we move the screen (and plate) forward until the visual image is somewhat blurred, we shall find that the photographic image, on development, is better defined. This class of truly single lens is sometimes used by photographers of the impressionist school, and they find it necessary, after focusing their image on the screen, to rack in the camera back to an extent ascertained by experiment.

Spherical aberration is rather more difficult to explain. In the last diagram we shewed all the

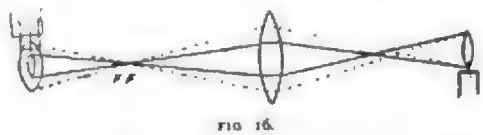


FIG 16.

rays from (say) the tip of the candle-flame, coming to one point on the ground-glass,

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BY THE RIVER

BY A. L. EIDEMILLER

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whether they pass through the centre or the margin of the lens. But this diagram was falsely drawn, merely to illustrate a point in passing; and what actually happens would be better represented by the above diagram, which is, however, grossly exaggerated. It will be seen that the rays passing through the centre of the lens pass through or focus at the point F, while those passing through the edges of the lens focus at *F'*, with the result that the images formed by the two sets of rays do not coincide; and, as every point in the lens gives a slightly different focus, we obtain on the ground-glass an infinite number of images, just as we did with a large pin-hole in fig. 12. The exaggeration in the diagram consists mainly in the enormous size of the lens, as compared with the size and distance of the objects. In actual work the lens would, as a rule, be much smaller (relatively). It will at once occur to the reader that by covering up the outer rim of the lens, and allowing only the centre to act, we shall have a greater sharpness of the image, just as we did when the pin-hole was small. But this image will not be so strongly illuminated.

Fortunately both chromatic and spherical aberration can be largely prevented by comparatively simple means. If, instead of using one single lens ground from one piece of glass, we make it of two pieces of glass, which differ suitably in their refraction of the violet and yellow rays, we can make the two sets of rays focus approximately the same point. In the same way, while the form of lens we have illustrated makes the marginal rays focus nearer than the central or axial rays a different construction would cause the axial rays to focus nearer than marginal. By combining two glasses, possessing the opposite properties in the right proportions, one will correct the other to a practically sufficient extent: and with this lens of two glasses we obtain what we desire, viz., a sharp distinct image, using all the rays that can pass through a comparatively large hole. In other words we are able, with a comparatively short exposure, to obtain an image free from chromatic and spherical aberration.

This form of lens, made from two glasses (usually a crown and a flint glass) is commonly spoken of as a "single" lens, and is also called an achromatic, or a landscape lens,—achromatic, because its chromatism (chromatic aberration) is cured; landscape because of its ordinary use. Even with such a lens the correction of the defects mentioned is relative, and not absolute; so we introduce a "stop" or "diaphragm" to cut off some of the rays, and use only a portion of the centre of the lens for the central rays, while the marginal rays can only pass through the margin of the lens. Thus we make a compromise, sacrificing something of our light (and rapidity of exposure) for extra sharpness of image. And as circumstances vary, so that at one time sharpness of image, and at another time shortness of exposure is the more important, the lens-makers provide a series of "stops," so that the photographer may use a large or a small one, as circumstances require.

This form of lens is exceedingly useful for all ordinary landscape work, groups and portraits, but it has certain defects which become very apparent when we use it for copying plans, or for photographing buildings and other objects, in which there are straight lines near the edge of the picture.

Curvilinear distortion is the chief difficulty in this direction, and though it is rather difficult to explain, we may be able to make it fairly clear by an exaggerated example. We may say that the defect is introduced by the stop or small aperture that we provided to remedy the aberration just mentioned. This stop cuts off the rays proceeding from the corners of the house to the centre of the lens, so that the image of corners and outer lines is formed entirely by rays passing through the outer portions of the lens, while the image of the central part (say the top of the door) is formed almost entirely by rays passing through or near the centre of the lens. The outer part of lens deflects the rays most strongly, so that the width and height of the house become diminished in proportion to the width and height of the door which is near the centre; while the corners are deflected more strongly than the centres of the walls, because they are more distant from the lens centre.



FIG. 17

Curvature of field is another difficulty with lenses. In our diagrams of the candle-flame we have represented the image as coming to a focus on a plane surface, as a flat ground-glass screen. As a matter of fact this does not happen, but the image comes to a focus on a curved field.

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The line *C* represents such a curved field, and it will be at once seen that if the plate

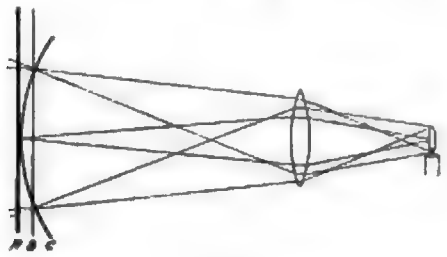


FIG. 18

(or ground-glass) is placed at *A*, the central part of the object will be sharp, while the top and bottom of the candle-flame will be out of focus. If the screen is placed at *B*, the top and bottom of the image will be sharp, while the centre will be out of focus. The best effect is obtained by placing the plate between these two points.

Fortunately, as in the case of aberration, this distortion and curvature of field can be largely overcome. While a single lens with the stop in front of it gives barrel-shaped distortion, the same lens turned round, with the stop behind it, will give the reverse, or pin-cushion distortion, thus:



FIG. 19.

and by combining two such lenses, and placing the stop between them, we form a "rectilinear" or "doublet" lens, which gives straight lines right to the margin of the picture. In the same way, while a single lens of given construction gives us curvature of field in one direction, concave towards the lens, the same lens turned round will give a curvature of field convex towards itself. Thus the rectilinear or doublet form largely obviated two distinct defects of the single lens. Here, as in all problems of practical optics, the result is relative, rather than absolute, for we almost invariably find that in gaining a given advantage we have to put up with a corresponding disadvantage; so that the whole science of lens-making is a series of compromises.

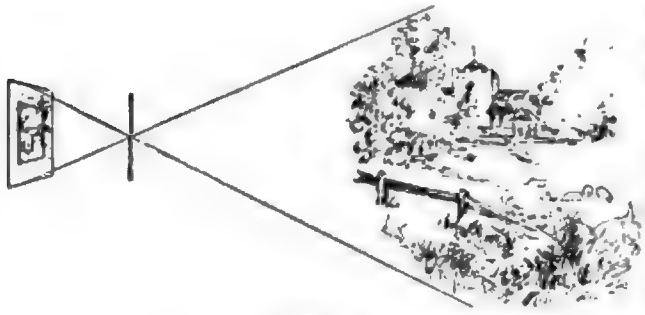
The single lens and the doublet, which is also called the rectilinear or the symmetrical, are the two main types of which all photographic lenses may be said to be modifications. As the rectilinear lens consists of two single lenses, mounted at opposite ends of a tube, it is possible to screw out one of the singles and use the other. In this case the single lens is about double the focal length of the doublet of which it forms a part, so that the rectilinear can be used for two distinctively different purposes. If the front combination is used, it will have a slight tendency to "pin-cushion" distortion, while the back will give slight distortion of the "barrel" type.

There is little more to say of the general construction of the lens, until we come to a more advanced hand-book than this, but there are one or two points in working that must be made clear.

First is the question of focus and focal length. We saw, with the pin-hole, that the image was, to all intents and purposes, equally sharp, whether the ground glass was three inches or six inches distant. In this case the rays of light from the object passed through a hole so small as to be practically a point. With the lens it is different, as we have seen; for, in order to get the image sharp, we must place the ground-glass at the point where the rays from the centre and from the sides of the lens meet, or focus (see Fig. 17). The distance between the centre of the plate and the centre of the lens when in this focus, is called the focus, or the focal length of the lens. Though this is not a scientifically correct statement, it is near enough for practical purposes, and is what is commonly used. It is not quite so easy to measure the focal length of a doublet as of a single lens, though for practical purposes it may be obtained by focusing on some distant object, and measuring the distance from the diaphragm aperture to the ground-glass. Opticians do it in a different way, and speak of the equivalent focus. This means the focal length that is equal to that of a single lens giving an image of the same size as is given by the doublet.

We have seen that, with a pin-hole, the distance between pin-hole and screen greatly affects the brilliancy of the image. In the same way with the lens; if we have a lens of (say) one inch diameter, throwing an image on a screen eight inches distant, the image will be just four times as brilliant as it would be if thrown on a screen sixteen inches distant. And as the brilliancy of the image directly affects the length of exposure necessary to the plate, the relative size of the lens opening to its focal length becomes an important factor in calculating exposure. It is, therefore, very neces-

sary to know the size of our "stops" or diaphragms, relative to focal length, and, in order to express this, we measure both. Dividing the focal length of the lens by the diameter of the opening of the stop, we place the result as denominator of a fraction, with *f* as numerator. Thus a one-inch stop in an eight-inch focus lens is $f/_8$ while the same stop in sixteen-inch focus lens would be $f/_{16}$. As, using a one-inch stop, the image at sixteen inches distance is only one-fourth the brilliancy of that at eight inches distance, it requires four times the exposure; but stops *marked with the same focal value* require a similar exposure. Or, in other words, the exposure in each case is proportional to the *square* of the *f* number. For convenience, the lens-makers mark the *f* numbers on the stops, and



usually arrange them so that each stop requires half the exposure of the next one smaller, or double the exposure of the next larger. They usually run $f/_8$, $f/_{11\cdot3}$, $f/_{16}$, $f/_{22}$, etc.

It may be asked whether with a single lens working at $f/_8$ we require the same length of exposure as with a doublet working at $f/_8$. Theoretically, there would be differences; and there are other refinements of the *f*-value question, into which it would be unwise to enter here. The broad rule that the exposure must always be proportional to the square of the *f* number is perfectly safe in practical working.

Wide Angle and Narrow Angle.—As a matter of fact all lenses are both wide-angle and narrow angle, as well as being both long and short focus at the same time. We state this apparent paradox because it is very necessary that the student should fully understand the matter, if he is to be the master, and not the slave of his instruments. Suppose we have here a lens of nine inches focus, throwing an image upon a half-plate (6½x4¾ inches). We should call it a medium-angle lens. If, however, we are only using it for a quarter-plate (4¼x3¼ inches), we should call it a narrow-angle lens; while, if we used it for a plate twelve inches by ten, it would be a wide-angle. On the quarter-plate it would be a long-focus, while on the twelve by ten it would be a short-focus lens. The terms wide-angle, short-focus, etc., are relative, not absolute; and depend upon the focus of the lens in relation to the plate it is covering. The ordinary rectilinear lens has usually a focal length about equal to the diagonal of the plate it is intended to cover; and a lens of focal length appreciably longer than the diagonal of the plate is called a long-focus or narrow-angle lens, for the two terms are interchangeable.

From this it might seem that long-focus or short-focus lenses can be used indifferently and interchangeably, but this notion has its limits. While it is true that any nine-inch focus lens covering a 12x10 plate is a wide-angle, it is also true that many nine inch focus lenses will not sharply cover a plate of that size. A rapid rectilinear is usually constructed to work with a stop as large as $f/_8$; while the wide-angle usually has its largest stop $f/_{11\cdot3}$ or $f/_{16}$. Although a wide-angle lens will always cover a smaller plate than that for which it is intended, a narrow-angle will not always cover a plate much larger than that for which it is made. And, although the wide-angle can always be used as a medium or narrow-angle on a plate smaller than that for which it is intended, it will not allow of such extremely rapid exposures as could be made with a medium, or narrow-angle lens.

All other things being equal, it is better to employ a medium-angle than a wide-angle lens; because, with the latter, the images of things near the edge of the ground glass (or sensitive plate) are in a strained or distorted perspective, for the reason explained in figs. 8 and 9. If it is necessary to have the image of a good size, and impossible to get far away from the subject, it is often absolutely necessary to use a very wide-angle lens.

The instructions in this chapter, if once fully grasped, will give a fair working knowledge of the properties of the lens.

"Place any number of artists or amateurs before a given subject, and the sketch or painting or photograph of each will not show so much what the limitation of material was, as it will be an expression of the perception of each." —*Horace Markley, Photographer*, in the *Art Interchange*.

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NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER III.

(*Continued from page 41*)

It will be seen from all this that a perfect periscopic image is never seen by the eyes of man, though in some of the lower animals the matter may be different. It is evident, too, for many reasons, that the photographic lens and the eyes do not show the same picture.

B. Intensity.

A quotation from Helmholtz will best illustrate this point. He says, "If the artist is to imitate exactly the impression which the object produces on our eye he ought to be able to dispose of brightness and darkness equal to that which nature offers. But of this there can be no idea. Let me give a case in point. Let there be in a picture-gallery a desert scene, in which a procession of Bedouins, shrouded in white, and of dark negroes, marches under the burning sunshine; close to it a bluish moonlight scene, where the moon is reflected in the water, and groups of trees, and human forms, are seen to be faintly indicated in the darkness. You know from experience that both pictures, if they are well done, can produce with surprising vividness the representation of their objects; and yet in both pictures the brightest parts are produced with the same white lead, which is but slightly altered by admixtures; while the darkest parts are produced with black. Both being hung on the same wall, share the same light, and the brightest as well as the darkest parts of the two scarcely differ as concerns the degree of their brightness.

How is it, however, with the actual degrees of brightness represented. The relation between the lightness of the sun's light, and that of the moon, was measured by Wollaston, who compared their intensities with that of the light of candles of the same material. He thus found that the luminosity of the sun is 800,000 times that of the brightest light of a full moon.

An opaque body, which is lighted from any source whatever, can, even in the most favorable case, only emit as much light as falls upon it. Yet, from Lambert's observations, even the whitest bodies only reflect about two-fifths of the incident light. The sun's rays, which proceed, parallel from the sun, whose diameter is 85,000 miles, when they reach us, are distributed uniformly over a sphere of 195 millions of miles in diameter. Its density and illuminating power is here only one forty-thousandth of that with which it left the sun's surface; and Lambert's number leads to the conclusion that even the brightest white surface on which the sun's rays fall vertically, has only the one hundred-thousandth part of the brightness of the sun's disk. The moon, however, is a gray body, whose mean brightness is only about one fifth that of the purest white.

And when the moon irradiates a body of the purest white on the earth, its brightness is only the hundred-thousandth part of the brightness of the moon itself; hence the sun's disk is 80,000 million times brighter than a white which is irradiated by the full moon.

Now, pictures which hang in a room are not lighted by the direct light of the sun, but by that which is reflected from the sky and clouds, I do not know of any direct measurements of the ordinary brightness of the light in a picture gallery; but estimates may be made from known data. With strong upper light, and bright light from the clouds, the purest white on a picture has probably 1-20th of the brightness of white directly lighted by the sun; it will generally be only 1-40th, or even less. Captain Almy's experiment put this at a lower figure, but this in no way affects the argument.

Hence the painter of the desert, even if he gives up the representation of the sun's disk, which is always very imperfect, will have to represent the glaringly lighted garments of his Bedouins with a white which, in the most favorable case, shows only the 1-20th part of the brightness which corresponds to actual fact. If he could bring it, with its lighting unchanged, into the desert near the white there, it would seem like a dark grey. I found, in fact, by an experiment, that lamp-black, lighted by the sun, is not less than half as bright as shaded white in the brighter part of a room.

On the picture of the moon the same white which has been used for depicting the Bedouins' garments must be used for representing the moon's disk, and its reflection in the water: although the real moon has only one-fifth of this brightness, and its reflection in water still less. Hence white garments in moonlight, or marble surfaces, even when the artist gives them a gray shade, will always be ten to twenty times as bright in his picture as they are in reality

On the other hand, the darkest black which

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the artist could apply would be scarcely sufficient to represent the real illumination of a white object on which the moon shone. For even the deadest black coatings of lamp-black and black velvet, when powerfully lighted, appear gray, as we often enough know to our cost, when we wish to shut off superfluous light. I investigated a coating of lamp-black, and found its brightness to be about one-hundredth that of white paper. The brightest colors of a painter are only about one hundred times as bright as his darkest shade.

The statements I have made may appear exaggerated. But they depend upon measurements, and you can control them by well-known observations. According to Wollaston, the light of the full moon is equal to that of a candle burning at a distance of twelve feet. Now, assume that you suddenly go from a room in daylight to a vault perfectly dark, with the exception of the light of a single candle. You would at first think you were in absolute darkness, and at most you would only recognize the candle itself. In any case, you would not recognise the slightest trace of any objects at a distance of thirteen feet from the candle. These, however, are the objects whose illumination is the same as that which the moonlight gives. You would only become accustomed to the darkness after some time, and you would then find your way about without difficulty.

If now, you return to the daylight, which before was perfectly comfortable, it will appear so dazzling that you will, perhaps, have to close your eyes, and only be able to gaze round with a painful glare. You see thus that we are concerned here not with minute, but with colossal, differences. How now is it possible that, under such circumstances, we can imagine there is any similarity between the picture and reality?

Our discussion of what we did not see at first, but could afterwards see in the vault, points to the most important element in the solution; it is the varying extent to which our senses are deadened by light; a process to which we can attach the same name, fatigue, as that for the corresponding one in the muscle Any activity of our nervous system diminishes its power for the time being. The muscle is tired by work, the brain is tired by thinking, and by mental operations; the eye is tired by light, and the more so the more powerful the light. Fatigue makes it dull and insensitive to new impressions, so that it appreciates strong ones only moderately, and weak ones not at all.

But now you see how different is the aim of the artist when these circumstances are taken into account. The eye of the traveler in the desert, who is looking at the caravan, has been dulled to the last degree by the dazzling sunshine; while that of the wanderer by moonlight has been raised to the extreme of sensitiveness. The condition of one who is looking at a picture differs from both the above cases, by possessing a certain mean degree of sensitiveness. Accordingly, the painter must endeavor to produce by his colors, on the moderately sensitive eye of the spectator, the same impression as that which the desert, on the one hand, produces on the deadened, and the moonlight, on the other hand, creates on the untired eye of its observer. Hence, along with the actual luminous phenomena of the outer world, the different physiological conditions of the eye play a most important part in the work of the artist. What he has to give is not a mere transcript of the object, but a translation of his impression into another scale of sensitiveness, which belongs to a different degree of impressibility of the observing eye, in which the organ speaks a very different dialect in responding to the impressions of the outer world.

In order to understand to what conclusions this leads, I must first explain the law which Fechner discovered for the scale of sensitiveness of the eye, which is a particular case of the more general *psycho-physical law* of the relations of the various sensuous impressions to the irritations which produce them. This law may be expressed as follows: *Within very wide limits of brightness, differences in the strength of light are equally distinct, or appear equal in sensation, if they form an equal fraction of the total quantity of light compared.*

Thus, for instance, differences in intensity of one-hundredth of the total amount can be recognized without great trouble, with very different strengths of light, without exhibiting material differences in the certainty and facility of the estimate, whether the brightest daylight, or the light of a good candle be used.

Herein, then, are contained the limits with which we can render true, and the physiological reasons why we can render a fairly true impression of a scene in nature by painting, but a far less true one by photography.

The only constant factor, then, is the *ratio of luminous intensities*,—that is, the picture must be as true as possible in relative tones or values. Obviously a picture of bright sunlight should

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look brighter in a moderately lighted room than the surrounding room, that is, its first impression on the observer should be as if he were looking at a landscape beyond the walls, through the frame.

From these remarks it will be seen how utterly impossible it is to render *truly* a bright sunlight scene, for if the values be true, starting from the top of the scale, the highest light, when you get to the middle tints, they are too black already, and the picture is out of tone and false. Obviously the right way is to start from the lower end of the scale, the *darks*, and get them as true as possible, and let the lights take care of themselves; but more of this anon.

D. Color.

As photographers, the matter of color exercises us but indirectly, still the subject should be understood, on account of its bearing on painting. "Color perception," says Le Conte, "is a single perception, and irresolvable with any other. It must, therefore, have its basis in retinal structure," it is, in fact, an internal sensation, and has no objective or external existence.

Helmholtz divides the vibrations of ether known as light into three degrees. He says the longest and shortest rays do not essentially differ in any other physical property, except that we distinguish them from the intermediate waves. Thus the ear can receive at once many waves of sound or notes, and they remain distinct, but notes of color do not keep distinct in the same way, "so that the eye is capable of recognizing few differences in quality of light," says Helmholtz, and can only perceive the elementary sensation of color by artificial preparation. He also says, the only bond between the objective and subjective phenomena of color may be stated as a law thus, "Similar light produces under like conditions a like sensation of color. Light, which under like conditions, excites unlike sensations of color is dissimilar;" what we want in art, then, is the *appearance* of the phenomena. The illumination of the sun's rays cannot be weakened without at the same time weakening their heating and chemical action; this is a point to be remembered in exposure.

Color is, of course, excited by the length of the waves and their frequency, red being the longest and slowest, and they diminish in length and increase in frequency in the order of the spectrum through orange, yellow, green, blue, indigo, to the shortest waves, which produce the effect of violet, the whole combined forming white. Now Hering has shown that there are only four primary color sensations, though he at one time included black and white, thus making six. The four are red, yellow, green, and blue, which are reduced by him to two complementary colors, red and green, and yellow and blue. In our present state of knowledge the Young-Helmholtz theory of three primary color sensations for red, green, and blue seems preferable as a working hypothesis, though it seems incompatible with anatomical and physiological facts.

All objective differences between color, may be reduced to differences of hue, difference of purity, and difference of brightness. These are the three color constants.

By tone, or hue, we mean in fact difference of color as in the spectral colors. Purity is greatest in the pure colors of the spectrum, and becomes less in proportion as they are mixed with white light. A pure or full color has no admixture of white. All compound colors are less full than the simple hues of the spectrum.

Brightness or luminosity is strength of light, or amount of illumination. It is measured by the total amount of light reflected to the eye A pure and bright color is full or saturated.

In nature black and white must be included among the primary colors when *quality* is spoken of, as light acts on black and white.

All differences of hue, therefore, are the result of combinations in different proportions of the four primary colors.

Among the defects of the eye in seeing color, Helmholtz says, "All are red blind at the innermost portion of the field of vision, all red colors appear darker when viewed indirectly."

The furthest limit of visible field is a narrow zone, in which all distribution of color ceases, and there only remain differences of brightness. Probably those nervous fibres which convey impressions of green light are alone present in this part of the retina. The yellow spot makes all blue light appear somewhat darker in the centre of the field.

All these inequalities are known and more or less rectified by constant movement.* As the eye becomes fatigued by bright light, so that it cannot at first answer to delicate stimulus, so it can become partially fatigued for certain colors.

Fatigue weakens the apparent illumination of the entire field of vision, hence the propriety of giving the impression as we first see it. Another reason for doing this being that the eye necessarily focuses the various parts to paint these, it

* Vide, pp. 191.

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gradually sees more and more detail in these parts, and so the painter is always in danger of losing breadth. We have not this danger to contend with as we do our pictures at one stroke, but we can realize the fault of overloading with detail by careless focusing.

The color of illumination of a picture, too, varies greatly by effect of local color.

What is constant in the color of an object is not the brightness and color of the light which it reflects, *but the relation between the intensity of the different colored constituents of this light, on the one hand, and that of the corresponding constituents of the light which illuminates it on the other*. For example, white paper in full moonlight is darker than black satin in daylight, or a dark object with the sun shining on it reflects light of exactly the same color, and perhaps the same brightness, as a white object in shadow. Grey in shadow looks like white.

Brightness of local color diminishes with the illumination or as the fatigue of the retina is increased. In sunshine, local colors of moderate brightness approach the brightest, whereas in moonlight they approach the darkest. Pictures to be seen in daylight do not admit of difference of brightness between sun and moon. As colors increase in brightness, red and yellow become apparently stronger than blue. Painters make yellow tints predominate when representing landscape in full sunshine, while moonlight scenes are blued. Helmholtz says: "Differences of color which are actually before our eyes are more easily apprehended than those which we only keep in memory, and contrast between objects which are close to one another in the field of vision are more easily recognized than when they are at a distance. All this contributes to the effect. Indeed, there are a number of subordinate circumstances affecting the result which it would be very interesting to follow out in detail, for they throw great light upon the way in which we judge of local color; but we must not pursue the inquiry further here. I will only remark that all these effects of contrast are not less interesting for the scientific painter than for the physiologist, since he must often exaggerate the natural phenomenon of contrast in order to produce the impression of greater varieties of light and greater fulness of color than can be actually produced by artificial pigments."

Again, when turbidity is composed of fine particles its appearance is blue, as the mists seen in autumn hanging round coverts, but it is whiter than the aerial blue because of the color of the covert behind. When this turbidity is absent the colors are brighter, hence the fierce blue on bright sunshiny days with easterly winds. This matter of turbidity must not be forgotten in portrait work; it is this which helps to give relief, hence the absurdity of all photographers' devices, the object of which is to minimize this turbidity. In addition to these is the ever-changing effect of atmosphere on color, that subtle medium with which the enchantress Nature produces ever-changing effects. In short the rule of aerial perspective is that atmosphere tends to make all distant dark objects blue-gray, whilst it either warms distant bright objects or leaves them unaltered.

Another point which must not be forgotten is that with bright illumination bright objects become more like the brightest, and with feeble illumination dark objects become more like the darkest. This is a very important matter, for it means that in bright sunshine the lightest greys are lost in white, whilst in dull weather the darkest greys are lost in black, hence the falsity of having deep blacks in brightly-lighted landscapes, and as has been shown, these are untrue, and the result of ignorance and of faulty manipulation. As Helmholtz has it, "The difference of brightness and not absolute brightness; and that the differences in them in this latter respect can be shown without preceptible incongruity if only their graduations are imitated with expression."

E. Binocular Vision—Psychological Data.

Single Image.

The remarks already made would apply equally well to man if he were a one-eyed animal, but we find there are other considerations to take into account since man is two-eyed. Now the phenomena of binocular vision cannot be treated of with such accuracy as the physical and physiological facts already discussed. It is obvious there is a common binocular field of view for the two eyes. Now Dr. Le Conte shows us that we see all objects double, except under certain conditions. When we look directly at anything, then we see it clearly, but all things nearer to us than the object looked at and beyond it, are seen double, or blurred and indistinct. This is the case in life, as can be proved, unless we contract diplopia from drink or drugs.

(To be Continued.)

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THE ADVANTAGES OF THE FERROTYPE.*

A great deal might be said in favor of the ferrotype, though we neither predict nor believe that it will ever supersede the photograph. We believe this, however, that thousands, yea, millions of ferrotypes can be made where no pictures at all would be made did not ferrotypes exist. For this reason they may be introduced by photographers in almost any quarter without fear of their damaging the other branches of the business. A fair trial, we think, will convince any one of the truth of this.

They are easily produced; the material costs but little; the profits are large, and the results are very beautiful and pleasing to your patrons if you exercise the same care in their production that you do in the production of photographs.

Among other advantages in their favor are the following:

1. They can be made and finished so quickly that the customer can wait for them. Your work is then done, and you get your money. There are no prints to make and tone, and probably spoil.

2. You do all the work requiring judgment and care yourself. The simplest employee can finish them, if ordinarily neat and careful.

3. There are many times when a ferrotype will meet the requirements of the case when a photographer would not do at all; for example, where parties are paying a hasty visit who will not have a portrait taken at all unless they can take it with them; where persons call unexpectedly from home want to take pictures of their friends with them; where the work of having one's portrait made for a special occasion is put off until the last moment; where one desires to have the number of portraits taken limited, thus avoiding any clash between photographer and patron as to the ownership of the negative.

4. They generally soften and flatter strongly-marked faces, and are great favorites with the public.

5. As they may be produced with such facility the best of people will often have them taken, when dressed in a special way; when celebrating an anniversary occasion; when desiring a picture to mark any particular event, &c.

6. The masses will have them made in quantity, because they may be had at a comparatively low price.

In all the cases mentioned, photographs would not be made, even if ferrotypes were not to be had, so that instead of the photographer's business receipts becoming depleted by the introduction of the ferrotype, on the contrary he would find them largely increased.

Again, if the ferrotype is introduced into new places, its *novelty* will attract many customers, and make much additional business. The prices need not be made too low. Charge enough for them. Also, when groups are taken, add something for each additional figure.

Ferrotypes are very beautiful and very popular in America, and large establishments, handsomely fitted up, are there devoted entirely to the production of these very popular pictures. An idea of the quantity made, may be had from the fact that in one month, recently, the Scovill Manufacturing Company (New York) alone sold $12,000 worth of the Phenix Ferrotype Plates. Add to this the quantity sold by the manufacturers to other dealers, and you have an irrepressible argument in favor of the ferrotype.



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GLADYS BY B. J. FALK

* *From the Ferrotyper's Guide*, Published by the SCOVILL & ADAMS CO. OF N. Y.

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We have to apologize for the delay in sending out our January issue. It was entirely due to the action on the part of the Postal authorities, who refused to accept the magazine as second-class matter, stating as the reason, that the photogravure picture inserted between pages 32–33 was attached to the mount and not printed directly upon it. Could anything be more absurd! We understand that this rule was made in order to prevent the wholesale distribution of samples of cloth, wall-paper, carpets, etc, which at one time were freely distributed thoughout the pages of trade magazines, advertisers taking advantage of the low rate of postage charged to publications, entered as second-class matter, to circulate these samples of their wares. We are of the opinion, however, that it reflects but little credit upon the intelligence of the authorities that they cannot distinguish a beautiful work of art from a piece of oilcloth or a strip of wall-paper.

Our first impulse was to cut out the offending picture and forward the magazine without it, but, rather than deprive our readers of it, we eventually decided to send it as third-class matter. This necessitated an extra expense of several hundred dollars, but we feel sure that our action will be appreciated by our supporters.

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Photographs made by the Roentgen rays are now becoming so familiar to us that the novelty of looking at such achievments is already worn out. We must seek something new, and Eureka! we have found it, at least the *Cincinnati Inquirer* has found it for us. It is a process of making pictures with granulated sugar. Here is the *Inquirer's* description:

"Photographs taken without the direct rays of the sun, or without the X rays, or any electric apparatus whatever, are something entirely new. This has been done by Mr. H. M. Redd, City Engineer, in some experiments he has been making. He first exposed some common granulated white sugar to the sun for two hours. Then, on an ordinary photographer's plate, in an ordinary frame, he placed several coins. Over this he placed a white oak board an inch thick. On this he spread a layer of the sugar, one-eighth of an inch thick. He covered half of the surface with a book, to see if any difference would be made in the sides of the plate. The whole was placed in an ordinary room for 48 hours. The plate was then developed, and a negative printed. The centre coin, an old-fashioned copper, was reproduced perfectly, head, stars, and date, in exact detail and very plainly. The other coins were fainter. Mr. Redd does not know just how or why this was done, but thinks that the sugar absorbed a certain amount of the active actinic, or X rays, of the sun's light, and transmitted them to the plate."

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A correspondent, Mr. Horace J. Miller, of Easton, Pa., writes as follows: "I wish to relate to you a strange experience (to me) that I had today. I exposed a rapid plate on an open landscape, using stop *f*/15, giving 4 seconds exposure. I developed the plate with pyro and ammonia, using Merck's 2 grains to the ounce; the image came up strong, but of a very light brown color after being developed. I thought the plate was stained by the pyro and after fixing and washing thoroughly, I tried the different plans of removing stain but of no avail. I then placed the plate in a bath of potassium bichromate, 30 grains to the ounce, acidulated with a few drops of HCl, and after lying in the bath for a few minutes the whole plate became a yellowish white, and stranger still, the image became reversed. Wishing to save the plate if possible, I thought I would follow the matter up a little further. I rinsed the plate well to remove the free bichromate; then taking it to the dark-room I redeveloped it with the ferrous oxalate developer—when the image again became reversed and became negative and of an intense black or greenish black color and perfectly free from the light-brown color which it had in the

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first stage. I consider the negative almost a perfect one as far as the development goes. I at first thought I had come across a freak plate and tried again, but with the same results. Thinking perhaps, some of the readers of THE TIMES could solve the riddle, I take the pleasure of sending you the above data."

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WE have to apologize for the delay in announcing the awards in our last competition, but the absence of the editor abroad must be the excuse. In our "Animal Study" competition the following have gained medals:

1st Prize, Silver Medal—Mr. W. Braybrooke Bailey Toronto.

2nd Prize, Bronze Medal—Mr. George W. Norris, Philadelphia.

3rd Prize—Mr. H. W. Nash, Pueblo, Col.

There were quite a number of entries to this competition, and many of the pictures were interesting. We shall reproduce several of them in future numbers.



STRAGGLERS BY W. BRAYBROOKE BAILEY

(Silver Medal, Animal Competition.)

In our lantern slide competition we regret to say the quality of the work sent in was very poor. Mr. Wm. Frazer's work was far ahead of any one else, except in the scientific class, where we have awarded the first prize to some remarkable lightning pictures by Mr. W. Archibald. We were unfortunately compelled to hold back many of the medals, the entries not justifying their award. The result is as follows:

Class I.—Landscapes. No awards.

Class II.—Marine. Silver medal. Wm. A. Fraser, N. Y. Bronze medal withheld.

Class III.—Genre studies. No awards.

Class IV.—Scientific subjects. Silver medal. William Archibald. Bronze medal, Wm. A. Fraser.

Class V.—Architecture. No awards.

Class VI.—Portraiture. Silver medal withheld. Bronze medal, Wm. A. Fraser.

The interest taken in these competitions is not sufficient to permit of our continuing them at present, although we shall be glad to receive suggestions from those of our readers who desire their continuance.

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OWING to copyright complications which require some little time for adjustment, the promised article by Mr. W. A. Eddy, on "Kite Photography," does not appear in this issue. We hope, however, to include it in an early number.

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YOUNG JACK RABBIT H. W. NASH

(Bronze Medal, Animal Competition.)

LIESEGANG, in the *Photographische Archiv*, draws attention to the following method of intensifying negatives. Certain developers possess the property of causing a pigment deposit to take place along with the silver deposit. This color deposit or stain is best obtained by employing a pyrogallol developer, from which the sodium sulphite has been omitted. Pyrocatechin can be substituted for the pyrogallol, and a similar stain can be obtained with amidol, if it is employed mixed with sodium bicarbonate. The amidol stain is more reddish, the pyro stain more yellowish. On treating the negative, which has been developed with pyrogallol or pyrocatechin, with a solution of potassium-ferric oxalate after fixing and washing, it is found to be intensified by the formation of an ink with the products of oxydation of the Pyro-developer which forms the stain. That it is the formation of such an ink which causes the intensification is proved by the fact that negatives developed with Hydroquinone or ferrous oxalate are incapable of intensification by the above method.

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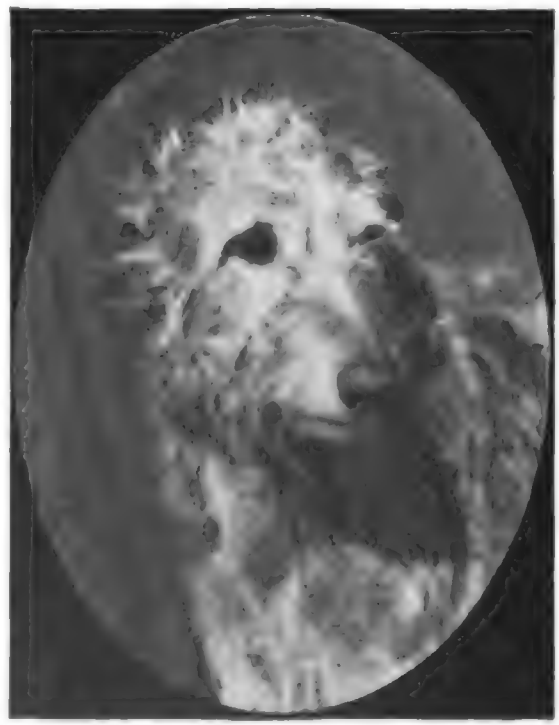
"N. LEV points out," says the *British Journal of Photography*, "that gelatino-chloride prints which have faded may be restored, to a great extent, by physical development. If mounted, they should be stripped off the mounts by laying on top of the print a piece of blotting-paper soaked in water, which should be kept constantly damped. After removal from the mount, the print should be soaked in water, and the whole of the mountant washed off, and the print allowed to soak till it is thoroughly and evenly wet. If the print has been much handled, it will be advisable to rub the surface with benzine before stripping. The print should be laid in a clean dish, and flowed over with a mixture of aristogen, which is an acid solution of hydroquinone, and a few drops of silver nitrate solution to which some acetic acid has been added. As soon as about half the required intensity is attained, the prints should be washed and fixed, as they dry rather darker. If the whites show any tendency to deposit, a weak cyanide bath should be used to clear them up."

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THERE are pending in the House at Washington two bills which will make a considerable change in the law of copyright, especially with regard to photographs.

The New York *Herald* referring to these says:

"The copyright law relating to photographs



A SCOTTISH GREYHOUND BY GEO. W. NORRIS

(Bronze Medal, Animal Competition.)

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is bad enough as it stands, since it opens the door to no end of abuses in the way of speculative and blackmailing suits brought by unscrupulous litigants. It provides that if any person without the written consent of the proprietor of the copyright shall publish a photograph, 'either in whole or in part or by varying the main design,' he shall forfeit, besides 'the plates on which the same is copied and every sheet thereof,' one dollar 'for every sheet of the same found in his possession.'

"The last clause has proved a serious obstacle to the cupidity of photographers who have been on the watch for any chance or pretext to bring an action for the penalties against a newspaper, for the courts have held that the number of copies found in possession can be determined only by an actual discovery before the commencement of the action. In the two bills to which we have referred this salutary clause is omitted, and in one of them the penalty is raised from a dollar to ten dollars for every copy printed—though fortunately under the law as it stands the aggregate of the penalties recoverable is limited to five thousand dollars. The effect of this change would be to enable a complainant to recover the penalties on merely formal proof easily produced, and would thus encourage the bringing and facilitate the prosecution of actions which already constitute one of the most flagrant abuses under the law of copyright—namely, those brought by or in the interest of photographers against newspapers which have innocently reproduced a copyrighted photograph, but without doing any damage to the owner of the copyright.

"There are those who think that photographs of persons are not a legitimate subject of copyright, and hence are not entitled to the protection of the law. However that may be, there can be no question that the protection accorded them should be commensurate with the damage done by the infringement of the copyright, and the true measure of damage, as in the case of a book, is the injury to the sale of the copyrighted production by the circulation of piratical copies. Now, it only needs a little common sense to see that the fair reproduction of a photograph in a reputable newspaper does not hurt the sale of the original, but, on the contrary, is apt to help it. Yet under the existing law a well meaning newspaper which has inadvertently copied a copyrighted photograph may be mulcted to the tune of five thousand dollars, and it is proposed to change the law so as to make the mulcting process easy, and thus put a premium on the bringing of speculative and blackmailing suits."

There are two sides to the question, however, and the *Herald* would apparently deny to photographers any protection against the wholesale robbery of their work by unscrupulous newspapers. While it is a fact that there are cases where the publication of a reproduction in a respectable magazine might help the sale of it, yet these are exceptional, and who ever heard of a fair reproduction of a good photograph appearing in a newspaper? As a rule such reproductions are villainous in the extreme, and more likely to decrease the demand for the photograph than assist its sale.

While we believe in protecting the magazines and newspapers from blackmailing suits, yet we also desire to see photographers protected from the many pirate publications that now exist.

* * * * *

If it is ever completed the largest lens will be that designed for the telescope to be exhibited at the Paris Exhibition in 1900. The diameter will be fifty-one inches, or eleven inches more than the Yerkes object glass, and fifteen inches greater than than in the famous Lick telescope. We have not heard what the cost will be for the production of this gigantic lens, but imagine it to be enormous. Whether the results will justify the expenditure is a matter yet to be decided upon. It is the opinion of the majority of astronomers that the practical limit was reached with the Lick telescope.

* * * * *

On page 104 we reproduce a study by Mr. E. Lee Ferguson. It is only fair to the artist to say that the reproduction gives but a slight idea of the original. The delicacy and softness of the platinum print is almost entirely lost. The picture was hung at the recent salon in London and very much admired there.

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"It is not at all surprising that the success of eminent artists should tempt many who are altogether unqualified to practise art—if it only tempted them to its *study* it would be well for them."—*Dogmas on Art.*

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"Things more excellent than every image are expressed through images."—*Jamblichus.*

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PRINTING IN SALTS OF IRON.

BY "RAL."

(*The Photographic News*)

The process of printing by means of the iron salts, either the ammonio-citrate or oxalate, is one of the oldest known, but has not come into general use owing to the comparative insensitiveness, and also the vivid blue color of the finished print, but is largely used for reproducing drawings, such as engineering diagrams upon tracing cloth, etc. The easiest process is that discovered by Sir John Herschel, and is as follows: A sheet of paper of good quality and not too highly sized is coated, by means of a ball of cotton wool enclosed in flannel, or else a broad Blanchard brush, with the following solution:

No. 1.

Ammonio-citrate of iron	1 ounce
Water (distilled)	4 ounces

No. 2.

Ferricyanide of potash	1 ounce
Water (distilled)	4 ounces

The last chemical must be pure, and should only be made up in quantity, when it can be used at once, as it rapidly deteriorates with keeping. Equal quantities of each solution are taken and applied to the surface as evenly as possible. The coating should be done in gaslight or weak daylight. The mixed solution will not keep. The paper is dried in the dark spontaneously, or by means of a gentle heat, and is of a greenish color. It is exposed under a negative in the usual way. The image being of a bright blue, the exposure necessary of course depending upon the negative, but for an average negative about ten to fifteen minutes in bright light should do. The exposure should continue until the high-lights seem over-printed and veiled. The print is fixed by simply washing in water until no more yellowness is imparted to the water. A small quantity of hydrochloric or citric acid added to the water will tend to clear the high-lights and brighten the color. Should the print be two dark, immersion in weak ammonia will reduce the image, but, if continued, will entirely destroy it. The ammonio-citrate of iron can be applied to the surface of the paper alone, dried and printed; the printing takes slightly longer and is not so visible. The print can then be developed upon the solution of ferricyanide of potassium by floating, which gives the blue image as above, or upon a weak solution of chloride of gold, which gives a violet image—this last being Sir John Herschel's "chrysotype"; the print then only requires washing and drying. Black prints can be obtained by floating the above upon nitrate of silver into which a few drops of gallic acid have been dropped. The above process gives prints in white on a blue ground, and is generally used for engineering processes. The method of printing these is the same as for films. The paper is placed against the back and exposed to light in a printing frame having plate-glass front and strong springs, taking care no creases are formed; it is printed preferably in sunlight. A process for giving blue lines upon a white ground, known as Pellett's process, is as follows:

Oxalic acid	77 grains	5 grammes
Ferric chloride	154 grains	10 grammes
Water	4 ounces	100 cc.

A well-sized paper is coated with the above and dried in the dark. When exposed the print is developed upon a solution of ferrocyanide of potassium, 1 ounce in 6 ounces of water, and is well washed and placed in a solution of hydrochloric acid, 1 in 10, which clears the ground and intensifies the image; it is then again washed and dried. The appearance of the blue prints may be improved by rolling or by applying a moderate amount of encaustic paste to the surface, which will increase the brilliancy. The ferro-prussiate paper can be procured commercially at a very cheap rate, but it will not keep any length of time, and so it is advisable to make it fresh as required. Transparencies can be produced in blue by adding to a clear solution of gelatine the first formula, printing deeply under a negative, and washing in acidulated water. The effect is rather pretty for some subjects. The coated plates will not keep, the gelatine seems to decompose.

HINTS ON NEGATIVE-MAKING.

BY JOHN A. HODGES, F.R.P.S.

I THINK the experience of most amateurs will bear me out when I say that the greatest difficulty the beginner encounters in the early days of his photographic career is in the production of the negative. He may not be aware of the fact at the time, but most of his printing troubles are due to this cause. A text-book writer may be as careful as he pleases in detailing the procedure necessary for the production of a good negative, the necessary qualities of which may be described in the simplest of language, but short of practical, or rather ocular, demonstration, the novice will find it a difficult task to appreciate and apply the information sought to be conveyed.

For this reason a practical lesson in developing is of the greatest value, particularly if it can be obtained in quite the early days of practice, before improper methods of working have been acquired, and those who cannot avail themselves of the help of some more experienced friend should certainly take one or two practical lessons from an experienced professional photographer.

Practice, in this respect, *i.e.*, in the making of negatives, does not necessarily make perfect, for I have known many enthusiastic amateur photographers go on year after year producing negatives of a character from which it would be impossible to obtain good prints by the printing processes employed. In the course of a year many hundreds of photographs are submitted to me for criticism, and often when passing judgment on them, I think how much more valuable to their producers would a criticism of the negatives be, for, in the majority of cases, the fault is fundamental—due to the negative and not to the printing.

I am not going to attempt to give a definition of the attributes which constitute perfection in a negative, for I consider that no hard and fast rule can be laid down. Its characteristics will, or rather should, vary according to the purpose for which it is to be used, or the printing process to be employed. A negative of a certain quality will not give equally good prints by all printing processes, and if the highest class of results are desired, the type of negative most suitable for the particular printing method to be employed must be

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ascertained, and that having been done, the negatives must be made of that character of type.

For this reason the beginner should make up his mind, before exposing the plate, what printing process he intends to use, for, taking a given subject—a landscape for example,—a very different kind of negative would be required for the carbon process than, for instance, gelatino printing-out paper. For the latter, a thin and delicate image is necessary, whilst for the former a more vigorous and much stronger deposit is required. Taking the printing processes now in vogue, printing-out paper requires a negative of a decidedly thin and delicate type. Bromide paper will generally print well with similar negatives, though a little more strength will be an advantage with the more rapid papers. Platinotype paper (cold-bath) also requires a soft and delicate negative in which the deposit in the high lights is not too deep to print before the shadows clog. The hot-bath paper, however, requires a stronger type of negative, one, in fact, that will give a good print on albumenized paper. Such a negative would also print well in carbon. It is true that sometimes we come across a negative that seems indifferent to printing methods, and yields good prints from all alike. Such, however, are rare, even with the most skilled workers, hence it is desirable in all cases to determine, at any rate, before development, by what process the prints are to be made.

Now let us consider some of the factors which determine the character of a negative. The two most important are exposure and development—though the developer and the plate have each an important bearing on the matter.

I may say at once that the most noticeable faults in the work of beginners are hard harsh prints, devoid of tone or atmosphere, the result of printing from a negative which has been under-exposed and over-developed. I have already pointed out the difficulty of describing a perfect negative, but even that is comparatively an easy matter to giving useful advice on exposure. By adopting the following suggestion, however, the beginner may help himself, and get on the right road without personal assistance. Assuming that he is about to take a photograph—it matters not of what—the first thing that has to be decided is the exposure That he must estimate, and let him bring all his judgment to bear in deciding upon its duration. For argument's sake we will assume that two seconds is determined upon and given. Now let him expose two more plates upon the same subject, but giving an exposure of one and three seconds respectively. Let him then develop the three plates, doing his utmost to get the best result from each. In the result, one, it is unnecessary to say, will be found to be far superior to the rest.

The duration of development will also, of course, have a very potent effect upon the character of the negative, and to illustrate this, three plates should be exposed in rotation upon the same subject, giving as nearly equal exposure as possible to each. The three plates should then be developed together in a large dish. One plate should be removed as soon as all detail is apparently out, the second plate should be allowed to remain five minutes longer, the third being removed ten minutes after the development of the first was stopped This experiment will demonstrate the effect of duration of development. We have, in fact, in this and the foregoing experiment a practical illustration of the effect of variation of exposure and development upon the negative image. In order, however, that the fullest advantage may be derived from these suggested experiments, prints should be made from each of the negatives, and when this has been done, and the results compared, any doubt as to the type of negative from which the best prints are obtainable will be dispelled from the mind of even the youngest beginner. It will then only remain for him to apply the knowledge so gained in his future work.

It is, as I have already said, of the highest importance to select a good developer, and, having done so, to rigidly refrain from using any other, notwithstanding the recommendations of others, until its behavior is fully understood and negatives of any desired kind can be made, at will, with it. Personally I have a strong predilection in favour of pyrogallol; and a great many years' experience with it and careful comparative trials with other developers, convinces me that it is still the best and most reliable all-round developer extant. This is not saying that other good developers do not exist, for the contrary is the fact, and for special purposes some of these may, and undoubtedly do, possess certain advantages, but I am for the moment, considering the question from the beginner's point of view, with the intention of assisting him in the choice of an all-round developer.

I do not like to take up time by giving formulæ; they have been so often repeated, but I will say that 10 per cent. solutions of pyrogallol (with a preservative), bromide of potassium, and ammonia ·880 will constitute all that is required.

Many beginners, and others with more experience, produce negatives of an undesirable type by using too much pyro in their developer. With a good, well-coated plate, 1 gr. of pyro to the ounce of water should give ample density for normal subjects, though it should be borne in mind that very rapid plates give density less readily than slow ones, and on that account it is necessary to add a little more pyro when using them. It is far better for the beginner, however, to confine his attention to slow plates until he has become fairly proficient in negative making.

It is probably impossible—to calculate with absolute accuracy the exposure for a landscape subject, for if we expose correctly for the foreground, the distance will have been greatly over-exposed. But, fortunately, such great precision is not necessary, and we find in practical every-day work that a fairly good result may be obtained within rather wide limits; indeed, were it not so, photography would be well-nigh impossible—at any rate out of doors. Recollect that if you must err at all it is best to do so in the direction of over rather than under exposure The faults produced by the latter are far more difficult to counteract or overcome than those due to the former. One must, however, always be guided by the particular result or rendering of the subject which is aimed at, and the exposure we give should depend upon whether we want a strong, brilliant effect, or a soft and subdued one. Slight under-exposure and a fairly strong developer will favor the former, whilst a full exposure, followed by development with a diluted developer, will secure the latter. What I wish particularly to impress

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upon you is the importance of working with a purpose, and with a definite object in view, and to avoid exposing plates in a desultory, haphazard sort of way, trusting to chance for some passable results to turn up out of many failures.

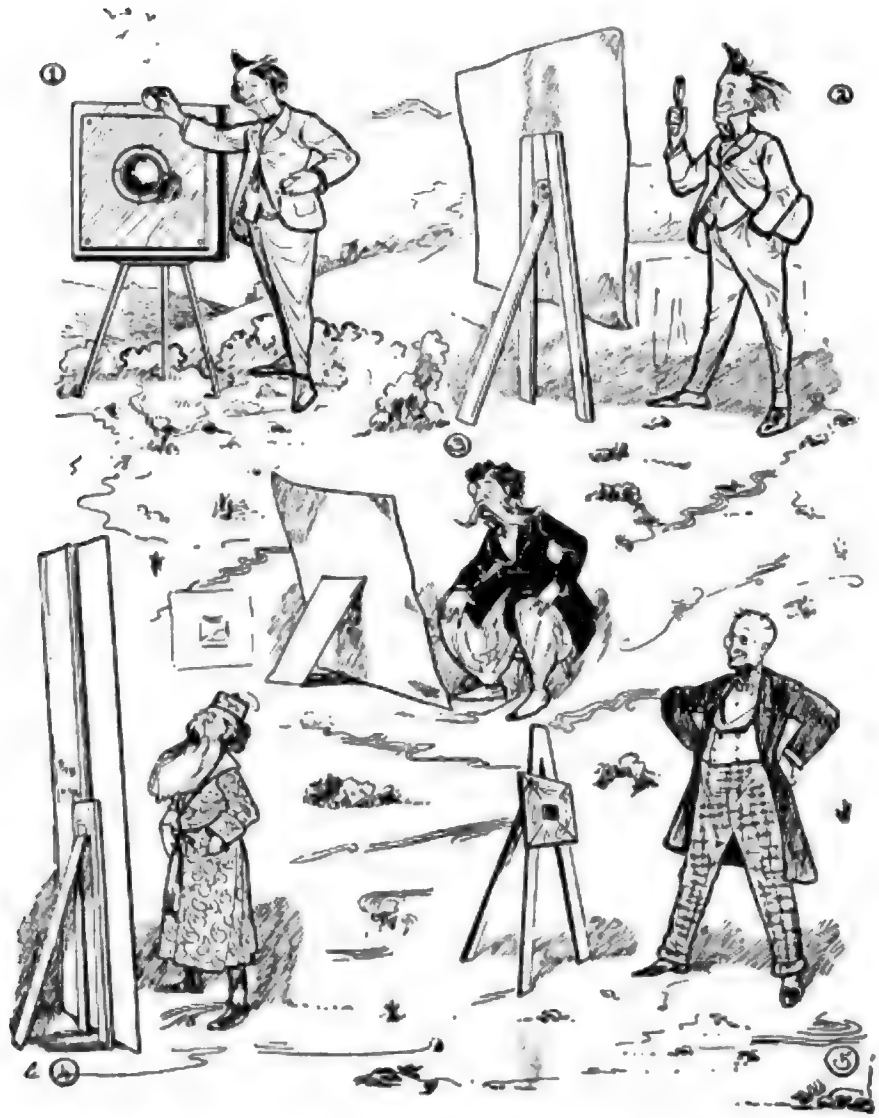
Avoid making your negatives too brilliant and dense. An erroneous impression seems to prevail amongst amateurs that what is called "a good technical negative," is one distinguished by such characteristics. Now, it would be difficult to lay down any hard and fast description of a "perfect technical negative," for its appearance would depend necessarily upon the purpose for which it was to be used, or the particular printing process to be employed. The main thing to aim at in landscape work is the preservation of gradation, but by giving generous exposures and developing with weak developers we shall be on the right road to securing these desirable qualities.

One word in concluding this always interesting topic: do not think because you may possess the eye and observation of an artist, and have possibly taken up photography with the sole object of picture making, that you are likely the better to succeed in your purpose by disregarding technique. Some few have done so, but generally with disaster to themselves, their hopes, and aspirations. The finest art has its technical side to master, which means, to the ambitious mind, much tedious but at the same time very necessary drudgery and close application, and photography of all others *is* a technical art.

The foregoing observations apply perhaps with greater force to the making of the negative than to any other part of the production of a photograph, because it is, as it were, the very foundation of the picture, and upon its suitability or the reverse success or failure will practically depend.



CHILD'S HEAD BY E. LEE FERGUSON



1.—In the infancy of photography he became an enthusiastic amateur. His soul was ablaze with the artistic flame, and his mind was filled with dreams of vast panoramic views of Pre-Raphaelite distinctness. So he hired him a 6ox8s, and betook himself to the top of a mighty mountain. And he exposed.

2.—He developed, and was hugely delighted with the result, for it was monstrous sharp and clear. "I can tell the hour by yonder clock twelve miles off," he chortled: "This is a Great Work" (capitals, please, Mr. Printer). "This is indeed Art."

3.—But as the years passed and the pegtops came in, he grew dissatisfied with his Great Work. "Nay," he murmured, "it cannot be Art, for it is distinct and clear. Fuzziness is Art. Sharpness is commonplace. Alack!" So he turned the negative round and printed it through the glass. And when he saw the result he wept for joy because it was so fuzzy. "This then is true Art," he exclaimed, "for none can tell what it is."

4.—But as the years passed, and he looked at his Great Work in cold blood, it did not appear such a Great work after all. "Art is immensity and Armitage," he mourned. "Art is all-dominant and imposing. It must be enlarged and mounted upon a great white card." So he did this and was satisfied.

5.—But as the years passed, and he once again looked upon his Great Work in more cold blood, he was filled with bitterness. "This largeness is not Art," he sorrowed, "Art is a jewel in a swine's snout, small, but, of great value and beauty." So he smote the white mount with a pair of scissors, and cut down the Great Work till it was no longer a Great Work, physically speaking. And he framed it close up in a mahogany frame, and he was enraptured. "This, then, it appears," said he, "is True Art; I have got it at last." But as the years passed, etc., etc., etc.

MORAL.—What True Art is, no one knoweth, for it altereth annually, like the time tables. For the Art which suited the Age of the Crinoline is not the Art which suiteth the Æon of the New Woman.

From The Practical Photographer.

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NOTES.

X Rays is the title of a new magazine published in New Zealand.

Subscribe now, before the January number is all sold out, otherwise you cannot complete the volume.

The Photographic News appears in a new and improved form. It is ably edited by Mr. E. J. Wall.

The Indiana State Photographers' Association will hold their convention at Indianapolis, on March 2, next.

Andy Emerine, Jr., of Fostoria, Ohio, sends us a tastefully gotten-up calendar for which we tender our best thanks.

The Camera Club of the Capitol Bicycle Club has changed its name and will henceforth be known as the "Washington Photographic Club."

Bound Copies of Vol. XXVIII can now be obtained from our publishers, price five dollars complete, or one dollar if the twelve numbers are returned in good condition.

Two First-Class Cameras for Nothing. For particulars see our advertising pages. This is a *bona fide* offer, and the instrument is one of the finest quality made by the American Optical Company.

From the publisher and editor we have received a copy of Vol. XXXIII of Wilson's Photographic Magazine. It is a fine example of Mr. Wilson's ability to supply the photographer with practical information and pictorial examples that aid him in his business.

Death of C. J. Mattison.—It is with the deepest regret that we learn of the death of Mr. C. J. Mattison, a well-known draughtsman and civil engineer, of Syracuse, N Y. He took a great interest in Photography and contributed several articles to these pages.

Sarony a Caricaturist.—The London *Daily News* says of the late Napoleon Sarony: "In many ways, it is said, he was really a caricaturist. His poses were sometimes so odd that the picture seemed like a travesty on Nature. For this reason, he excelled in theatrical portraiture."

"The Omaha Daily Bee" has a column headed "Amateur Photography," the most impudent piece of piracy we have seen for a long time. Two articles from our '97 "Annual," one by Mr. F. J. Burnett and the other by D. G. Archibald, have been reprinted without the slightest acknowledgment either to the authors or to the source from which they were stolen. In the whole column there are only eleven lines of original matter.

Reducing and Clearing Negatives.—M. Lainer says in *Photo-Rundschau* that to reduce negatives that are too intense, or to clear those that have fog, an immersion of from six to twelve hours in a hypo-sulphite bath strongly acidulated with sulphuric acid will produce the desired effect. M. Doll employs a rather original method for strengthening negatives that are too light. He first steeps the plate in water so as to cause the gelatine to swell, then he immerses it in a solution of carmine. As this operation may be repeated several times it is well to make a solution having but little color, so as not to overdo the strengthening of the negative.—*Photography.*

How to Color Lantern Slides.—The slide should be so supported at an angle of about 45 deg. that it may be viewed by reflected light thrown from a sheet of quite white and clean paper lying flat on the table. An impromptu holder may be extemporized by using a printing frame from which have been removed the back and springs. A sheet of glass (*e.g.*, old clean negative) rests in the rabbet of the frame, say, of whole-plate size. A piece of thin card is cut to fit the frame and rest on the glass. Out of the center of the card a square opening is cut just large enough to admit the transparency to be colored. A couple of books at each side support the front edge of the frame, and also another piece of card to prevent light falling on the surface of the slide and to shield the eyes from all light except that reflected through the transparency.

Submarine Photography.—A writer in the *News*, commenting on the work of Monsieur Bouton's photographic work on the bottom of the sea, says: "I would give something to have a good clear print of the oozy vegetation on which the Trilobites used to exist, but no doubt M. Bouton cannot lower his apparatus to the depths where that sea-monster once wallowed." And he concludes: "In those days

> "' The Trilobites sported in fancy free
> On the beds of the Cambrian ooze,
> For the world, as far as the eye could see,
> Without taxation, or rent, or fee,
> Was theirs just to pick and choose;
> They used their minds to but little effect,
> In a crude crustacean way;
> And what was beyond the mud they flecked,
> Their entomostraceous intellect
> Had no desire to essay.'"

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Mercury Paper.—The following method is given in the *Photo-Rundschau*: Place a quantity of pure mercury in a dish and cover it with ordinary nitric acid. Allow it to stand, at a fairly low temperature, for a few days, when the liquid will be changed to a thick crust of moist crystals, which are then separated from the unchanged mercury and spread out on blotting paper to dry. They will always be somewhat moist, some nitric acid remaining in the crystals. Dissolve 230 grains of these crystals in five ounces of water, and add nitric acid to dissolve any precipitate that may be formed. Now, take plain paper and coat this with starch paste, dry it, and float it on to the mercury solution as described above. Two or three minutes in a dark room or room lighted with a candle will not matter. This paper is dried quickly and kept in a chloride of calcium preserving canister until used. The time necessary for printing is short; under an ordinary negative of medium strength two or three minutes will be found sufficient. The developer is made as follows: Sulphate of iron, 65 grains; tartaric acid, 65 grains; water 10 ounces. The image appears very rapidly, and is fixed in common salt, 90 grains; water, 4 ounces. The picture will be found to be of a grayish color, and after remaining for five minutes in the salt solution it is toned in the following platinum bath: Potassium chloroplatinite, 3 grains; tartaric acid, 60 grains; water, 7 ounces. The result, if properly done, will be a fine black tone and a permanent picture.—*Photography*.

Reproduction of Engravings and Photographs of Objects of Art.—M. le Dr. Precht describes a method which he makes use of for the reproduction of engravings, and which enables him to obtain clearness and an abundance of details which is at once surprising. The engraving is immersed in water for a few minutes, and placed damp upon a sheet of glass, and photographed by transmitted light.

In the same journal Hans Schmidt gives useful directions for photographing objects of art. An harmonious lighting, without reflections, and which preserves the high lights upon the striking part of the object, is the principal condition.

To avoid reflections, the light should be diffused by means of a fine black gauze.

Opaque vases can with great advantage be filled with ice or very cold water, which will have the effect of producing a kind of dew, which will give to the object a dead matt surface.

For photographing polished furniture it is necessary to cover the windows with gauze and to remove all objects capable of giving reflections, then, if necessary, put in front of the camera a black curtain, through which we only allow the lens to pass. The reason for this will be at once apparent.

Transparent objects are placed in front of a dark background, velvet by preference. All engraved glass should be dusted with black-lead powder or resin.

Glass vases, elaborately decorated on their whole surface, should be filled with a blue colored-water or cigar smoke. By these means is prevented the pattern (engraved or otherwise) on the back being confounded with that nearest to the objective.—"*Photographische Rundschau*."

Applying Color to Lantern Slides.—If moist water-colors are to be used, it will be found that the film rather repels the water in places and absorbs it unevenly at other places. To minimize this, keep the brush rather dry, *i.e.*, use as little water as convenient, and add to the water a little "prepared oxgall" (to be bought of artists' colormen). As the application of colors to slides now-a-days is almost entirely restricted to flat washes for diagrammatic purposes, *e.g.*, maps, plans, drawings of apparatus, etc., etc., it is important to use as large a brush as convenient, and not to go over the same place more than once.—*The Amateur Photographer* (English).

Tinting Lantern Slides.—By this term, says *The Amateur Photographer* (English), is generally meant the application of some one tint or color all over the slide. This is generally done in one of three ways. First, a thin piece of colored glass is put into the lantern either behind or before the slide. Secondly, a solution of a suitable aniline dye is made in alcohol. This is added to plain collodion, and the film surface of the slide when quite dry is evenly coated with the tinted collodion. Thirdly, the gelatine of the slide may be stained or dyed by immersing it in a solution of either an aniline dye soluble in water, or one of the now popular Judson's penny packets of dyeing materials dissolved in water.

If a flat wash (as in a map or plan) be required for a certain portion only, this may be locally applied with a soft camel's-hair brush. But if you do not wish for trouble, do not bring the edge of one patch within a quarter of an inch of another tint, unless the first is *quite* dry before the second patch is applied; otherwise you may find one part "run" into its neighbor.

How to Make Gold Paint.—Gold paint may either be made from real gold or from a soft brass in imitation of real gold. The method of making the former is as follows: Take about equal weights of gold leaf and honey, and grind slowly in a porcelain mortar until a uniform paste is formed, transfer to a filter paper and wash thoroughly till all the honey is removed, leaving the gold powder upon the filter. Or wash the gold and honey paste out of the mortar into a beaker with three or four times its weight of water, allow the gold to settle, and pour off the supernatant liquid; repeat the operation in the beaker till the gold powder is quite free from honey. The last washing water should be slightly alkaline, in order to remove any trace of grease which may be present. If the finely-divided gold is to be kept for some time before using, it should be carefully dried and put in glass bottles. To make the gold thus prepared into paint, dissolve one part of pure gum arabic in four parts of distilled water, and mix with one part of soluble silicate of potash (water glass), then grind in sufficient of the finely-divided gold to give the consistency of paint. The final point is attained when all the gold powder remains suspended and shows no tendency to settle. Imitation gold paint is made by taking thin brass foil, or Dutch leaf, and grinding with honey in the same way as with pure gold, and proceed as above. Both the pure gold powder or the imitation powder may be purchased ready for mixing. The imitation powder is known as bronze powder (flesh). If an insoluble oil paint is re-

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quired, grind some calcined magnesia with a little turpentine, then add the pure gold or gold bronze powder till the whole is thoroughly incorporated, finally mix with copal or pale varnish to the consistency and brilliancy of the paint required. The object of the magnesia is to give the paint a body and prevent the gold powder from settling. A spirit paint may be made by grinding the magnesia as above, but using methylated spirit instead of turpentine, and shellac varnish instead of pale varnish.

Novel Photographs.—A French photographer has pleased Paris, always charmed with a novelty, by producing extraordinary photographic combinations through an ingenious arrangement of mirrors. The results he attains are novel, surprising, and sometimes sensational, as, for instance, his *bona fide* photograph of a well-known Parisian being in the street by his horse. Grotesque combinations such as this are, of course, familiar to us all for photographers have have long been able to produce very curious effects by embodying figures from several negatives in one print.

The beauty of this last photographic novelty is, however, that the prints do not "give away" the process, as the old-fashioned built-up photographs invariably do by the stilted postures and incongruous discords of the composition, but appear to be single, instantaneous glimpses of real scenes of an altogether impossible nature. They are clever enough to deceive an expert, or to make a superstitious person almost believe in miracles.

All Paris is enthusiastic over one of his pictures in particular. It is a photograph of a gentleman in evening dress, with the face of his fiancee daintily poised on his immaculate shirt front. The girl's face seems to be as much a part of the man's figure as is his head, and not merely a picture stamped on the white linen bosom.

This feat is accomplished by posing the figures in such a way that they are reflected from the maze of mirrors directly into the eye of the camera. Sometimes the woman's face is reproduced in a smaller form, and in the shape of a heart, and is so arranged as to take the place of the organ in which the god of love is popularly supposed to dwell.

Photographs taken by the mirror process show people in every conceivable position. For instance, two brothers are photographed to appear as one balanced upside down on the other's head. As both are in evening dress, from patent leather pumps to crush hats, it is difficult to decide when one has the picture right side up. Pictures of animals in all conceivable positions are a fad of this photographer, whose art often takes a humorous turn. A very small snake in the act of swallowing an unusually large elephant is a favorite with those who have a sense of the ridiculous. Other pictures, however, lean to tragic rather than the comic.

A pyramid of babies, to the number of a score, is another picture which attracts a great deal of interest, for, though the tots are still in the long-clothes period of existence, they appear to balance themselves with all the *sang froid* of professional acrobats.

One large photograph which the Parisian camera juggler lately exhibited at an exhibition of pictures noted more for their oddity than the popular character of their subjects, is probably the most grewsome of any he has yet taken. This photograph portrays an exceedingly beautiful woman dressed as for a ball, through whose body the bare arm of a man is thrust, the hand clasping the handle of a sword that is dripping with blood. The woman's face is distorted, as though with pain, and she seems about to fall to the ground.—N. Y. *Herald*.

Mr. John E. Dumont is kind enough to send us a most attractive little calender, issued by *The Post Express*, of Rochester. The illustrations are all from Mr. Dumont's beautiful photographs, many of which have adorned these pages.

Beware of the Thief.—Mr. Theo. Gubelman, of Jersey City, N. J., writes us as follows: "Yesterday at noon a man representing himself as negative retoucher applied for work at my gallery, subsequently ask the privilege of the use of the lavatory, he went up stairs and left with a polite bow an hour afterwards a Steinheil Anti-Aplanatic group lens, size V., No. 20,072, was missing.

"The man is about 25 years old, 5 feet 6 inches tall, rather broad across shoulders, clean shaved face, small eyes, large nose. He called on several photographers here, and in one gallery only half a block from my establishment, he also asked the privilege of the lavatory; as he called there before, it is apparent that this was only a dodge.

"Any publicity you can give to this matter to protect the fraternity will greatly oblige."

Voice-Photography.—The voice photographing apparatus was devised by Dr. Hallock, to assist them in the acquisition of certain data of much importance in their studies. His object was to ascertain accurately what was the acoustic composition of tone generally acknowledged to be good, and likewise that of inferior tone, that, by comparing them, the dominant characteristics of each might be determined. The scope of this article permits but a brief description of the apparatus and the principles upon which it is based.

A string vibrating to produce tone vibrates as a whole, producing the fundamental or pitch tone, and may also vibrate *at the same time* in segments, dividing into halves, thirds, fourths, fifths, sixths, etc., producing partial tones or overtones, which are heard at the same time with the fundamental, though except to a very highly-trained ear they are not distinguishable as separate tones. These overtones give to the tone its richness and fullness, and it is by variations in their use that we articulate vowels. The tone of a string, then, instead of being simple, is a composite tone or *klang*. The voice follows the same laws, being practically a string instrument and having the same series of overtones, while in a reed, to which it has often erroneously been likened, the first overtone is more than two and a half octaves above the fundamental and higher than the fifth overtone actually found in the voice.

By the use of the hollow brass spheres known as Koenig resonators, each of which is tuned to the pitch of one of the overtones in a given *klang*, it is possible to pick out all of these single tones. The air vibrating within the resonator reinforces the particular tone that has the same pitch, and if held close to the ear will make that tone more prominent to the listener than any other in

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the *klang*. The apparatus is a modification of that used by Helmholtz and Koenig for tone analysis, but the plan of photographing the flames is original with Dr. Hallock. —From "Voice-Photography and Rational Voice-Production," by LAURA CARROLL DENNIS, in January *Review of Reviews*.

Clearing Stained Negatives.—When hydroquinone is used for developing negatives, and owing to an insufficient amount of solution having been used, a deep yellow stain has resulted from the consequent exposure to the air, it may be cleared in the following manner: Soak for about half an hour in a very weak solution of ferricyanide of potassium, and then, after rinsing, replace for a minute or two in the hypo bath. Care should be taken that the negative is not placed in the clearing solution direct after leaving the hypo, without rinsing, for these two chemicals together form a powerful reducer which would quickly destroy the finer details. By itself, the ferricyanide solution merely acts as a clearing bath.

An Exhibition of the Arts and Crafts to be Held in Boston.—A movement has been inaugurated in Boston which promises to be a distinct influence in the development of art as applied to common forms of construction and manufacture. Since the appreciation and demand for utensils and furnishings which possess artistic merit, come largely from the display of ideals, an exhibition of the arts and crafts has been organized for the purpose of giving recognition and stimulus to those artisans who are doing good work. The exhibition is to be held in Boston from April 5th to 17th. Although almost entirely new in this country, such exhibitions have been held successfully in England for several years and have exerted a great influence over English manufactures.

The scope of such exhibitions is quite surprising to those who have not considered how extensively the arts are concerned in manufactures. Among some of the subjects within the scope of the exhibition are the following:

Furniture; glass; rugs; wall paper; silver plate; fire places; illustrating; printing; stained glass; mural decorations; iron, brass, bronze, and other metal work; pottery; carpets; embroideries; draperies; lamps; carved wood; engraving; stone carving; picture frames; electric, and gas fixtures.

This will be one of the first exhibitions in Boston in which illustrating, engraving, and printing will have a prominent place. Many of the designers and illustrators have already planned to exhibit, and it is expected that there will be a large representation of the engraving companies. Three-color process work will also be shown, and, as many of the companies have been doing much experimenting on this line, this will form an interesting feature. The exhibits of printing will consist largely of fine book-making, perhaps some posters, and a few cases of catalogue and mercantile work which show real merit.

The exhibition is not intended to be a trade affair at all, but for the display of artistic work and the encouragement of many who are devoting themselves to applied art in its various lines. Applications for space are filed with an Advisory Board, which consists of leaders of art matters in Boston, and if the proposed exhibits possess such merit as to make them worthy of admittance they are accepted. No charge is made to exhibitors. The Advisory Board consists of the following members:

CHARLES A. CUMMINGS, *Chairman*.

GEN. CHAS. G. LORING,	A. W. LONGFELLOW, JR.,
ROSE TURNER.	C. HOWARD WALKER,
DENMAN W. ROSS.	R. CLIPSTON STURGIS.
WM. STURGIS BIGELOW,	SYLVESTER BAXTER.

The exhibition gives promise of bringing out an immense quantity of new designs. Application blanks for space and copies of the prospectus, which is an interesting example of modern printing, may be obtained by addressing the Director, Henry Lewis Johnson, 185 Franklin Street, Boston. All exhibits are to bear the name of the designer and maker. Mr. Bertram Goodhue is making designs and decorations for the handbook of the show, which will be a finely illustrated book.

Tropical Troubles.—Under this head a writer in *Shorland's New Zealand Journal* tells of some of the climatic difficulties which beset the dweller in Australasia. He says: "Yes, of course, we use dry plates, and therefore you will suppose that we have no reason to complain. Wait and hear a few growls of discontent. The friendly advice so kindly printed on the outside of the case, 'Keep in a cool place,' is very much appreciated, only when the coolest place is not less than 90 deg. it is apt to be satirically provoking. Yes, we do occasionally get cool sea breezes—then the temperature falls to about 80 deg.—and now and then we have a few cold nights in the winter season, when we shiver at 70 deg. and get out our blankets. There is another senseless and sarcastic piece of advice: Everything is labelled, 'Keep dry.' Keep dry, indeed. Why, with half-a-dozen shirts a day it would be impossible to keep dry; and to be shut up in a dark room for half an hour is enough to reduce one's fighting weight by half a stone. One fellow who was recommended as changing boy had a lively time of it, for a swarm of mosquitoes saw their opportunity and made the most of it, while the poor victim danced and objurgated in a most mirth-provoking manner, amusing the score of natives, who wondered with staring eyes at the curious *haka* the *papa-langi* was performing. Keep dry! When the rainy season pours its torrents over the land, and everything is hot and wet, moist and damp will not describe this condition of climate. Wet, reeking, soaking, dripping wet—everywhere and everything; a glorious season for the microbes of mildew and miasma, and only soldered tins or stoppered bottles are proof against it. 'Warranted to keep in any climate' is another fond delusion. One good, patient worker informs us that in about two years he has had to turn out more than a hundred dozen plates of various brands as utterly ruined by damp. The insinuating mildew gets into every box, and only a few brands of plates are proof against it. Picture to yourself the charm of a sea trip in a small boat to a distant island, where are some rare chances for the photographer. He has twenty boxes of plates, and makes the most of his time; but, alas for the pleasure and profit of the adventure, every plate is bad—ruined; irretrievably ruined, by a mildew like small cobwebs and nasty holes all over the plates, and some look as if bombs had burst in the centre of the sky. Our friend wonders if the English language has any words capable of expressing but a tithe of his feelings when plate after plate, through the whole batch, turned out such a deplorable mess—bursting bombs was but a mild form of explosion."

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TRADE NOTES.

The Christmas Number of "The Trade News," a bright little monthly published by Messrs. W. D. Gatchel Sons, of Louisville, Ky., is full of matter interesting to the photographer. The reproductions are specially good, and we congratulate the publishers on their efforts.

J. B. Colt & Co., of 115 Nassau street, New York, the well-known manufacturers of optical lanterns and projection apparatus, have removed their St. Louis office to 517 Olive street.

The free attendant service maintained by the New York Central at Grand Central Station, New York, is another example of the care and courtesy by which patrons of the great railroad are surrounded.

Mr. H. A. Hyatt, St. Louis, Mo., the well-known dealer in photographic supplies, sends us his latest catalogue. It is quite an encyclopædia of photographic materials and apparatus. We advise every photographer to obtain a copy.

"The News-monger" is the title of a bright little photographic monthly, published by the Cramer Dry Plate Co., of St. Louis, Mo.

The "Acetylene Trust (Ltd.)." has been incorporated in England with a capital of £60,000 in £1 shares. "To acquire, develop, and deal with an improved method of and apparatus for generating acetylene gas, and to manufacture, and deal in gas for lighting and other purposes.

The Theory of Success.—The New York Central management evidently proceeds on the theory that the more care there is taken of a traveler, the more he will travel—witness its "Limited" trains, block signals, free attendants and the comfort and luxury surrounding one from beginning to end of a journey on "America's Greatest Railroad."

The American Annual.—Mr. Woodbury certainly deserves great praise for the excellent quality of the '97 Annual. It is clearly ahead of any previous issue, which is about the best praise we can give it. Nearly three hundred illustrations are given, all of which have real merit. The reading matter is of a very interesting nature, the contributors having evidently been selected with the idea of making the Annual this year of actual benefit to photographers, both professional and amateur. Considering the elegant appearance and the exceedingly great instructive value of this volume, we do not wonder at the fact that the first issue of 12,000 copies is already nearly exhausted.—*Canadian Photographic Journal.*

NOTES ABOUT PHOTOGRAPHERS.

Van Starnes, a valued contributor to these pages, has just published a book upon "Whist."

Horace Wilmer will succeed Chapman Jones as honorary Secretary of the Royal Photographic Society.

L. G. Burnham, of Burlington, Vt., is doing some fine portrait work, judging from the sample we have received.

Dr. P. H. Emerson, the author of the series of articles on "Naturalistic Photography," now appearing in this magazine, will shortly publish a book on Cuba.

L. McDaniel, of Templeton, Cal., sends us two interesting photographs. One is a coyote killed while chasing a fox, and the other a view of the vessel St. Paul, wrecked near Monterey, Cal.

John Carbutt showed us recently some fine radiographs made upon his X-ray plates. They are undoubtedly the finest we have seen. The detail is so clearly defined that the word shadowgraph can no longer be correctly applied.

H. P. Robinson's autobiographical sketches will be read with interest. He is the pioneer of artistic photography, and his life has been a most eventful one. The series will be continued in several issues.



PORTRAIT BY A. L. EIDEMILLER

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF NOVEMBER, 1896.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

No. 571,855. Photographic Plate Holder. Mathias Flammang, Newark, N. J., and Frank Miniot, New York, N. Y.

A holder for photographic screen plates and the like is provided with oppositely arranged lazy tongs movable toward and away from each other and carrying plate holding devices at their free ends.

No. 571,995. Magazine Camera. Leander Dustin, Rochester, N. Y., assignor to E. R. Andrews and A. L. Lehnkering, same place.

A magazine holder is formed with a supporting frame and a series of oscillating posts are provided with radial arms and offset delivery and separation wings. Means are provided for forcing the carrier forward and an oscillating spider is connected with the radial arms by crank-arms, each having a pin adapted to enter and be guided by suitable slots.

No. 572,005. Manufacture of Mineral Colors for Ceramic Photography. G. J. Atkins, London, England.

The metalic components of mineral or enamel colors are saturated with chromic acid or chromates before they are mixed with the gelatine or other colloid substance for forming the sensitive films.

No. 572,173. Photographic Finder. A. C. Mercer Syracuse, N. Y.

In carrying out this invention a negative lens is suitably supported and fixed in the front opening of a box perpendicularly to and first in the path of the light passing from the object or view through the finder to the eye. A triangular glass prism is suitably supported and fixed just behind the negative lens below a top opening in the box, also in the path of light. This prism is provided with two polished internally-reflecting faces, one of which, not silvered, is placed or cut at such an angle to the other which is silvered, that the first face transmits one part of a ray or pencil of light on its way from the internally-reflecting face to the eye. A third upper emitting and refracting polished face of the prism, oblique to the now emitted and refracted ray or pencil of light, is fixed at such an angle to a black screen that the latter only is reflected to the eye by the emitting and refracting face. Finally two contours, bounding the front and top openings are so proportioned as visually to coincide when the eye is correctly located in using the finder.

No. 572,178. Flash-Light Apparatus for Photographic Purposes. H. E. Rathburn and F. Bebby, Pawtucket, R. I. Said Rathburn, assignor to said Bebby.

A portion of a suitable stand is arranged to form an electric conductor. A cartridge is supported by this stand and provided in itself with an electric wire adapted to ignite the charge of flashing powder and also provided with means for pressing the igniting wire against the conducting portion of the stand.

No. 572,663. Photographic Plate Lifter. S. C. Smith, Philadelphia, Pa.

A plate lifter is formed of an oblong piece of sheet-metal bent at an angle of 90 degrees, or less, and to the base of the angle of this piece is secured a U-shaped wire having its arms bent to form spring clasps for engaging the side of the photographic tray.

No. 572,927. Photographic Vignetter. Wm. Eddowes, Newark, N. J.

A supporting frame or tripod is attached to the camera and a block secured at the converging ends of the tripod arms. A vignette-holder is pivoted to the outer end of an adjustable frame pivotally supported on the tripod block. The relative position of the vignetter toward the axis of the lens tube is adjusted by means of cords connected, respectively, with the adjusting frame and with the upper and lower ends of the vignette holder.

No. 573,309. Magazine Camera. Frederic Stubbs, Sheffield, England.

A camera is provided with a magazine chamber for containing plates and located at one side of the exposure chamber, a slide being arranged to move between the two chambers in a plane at right angles to that of the plates and having a projecting handle. A plate frame is secured to this slide and is arranged to be brought in line with any of the plates in the magazine chamber, and a flexible stop is actuated by the slide and arranged to retain all the plates in position except the one entering the plate frame.

No. 573,499. Automatic Photographic Shutter. P. L. Wilkinson, York Station, Ala.

A shutter box is provided with a spring-actuated rotary shutter-disk working therein and having an off-standing catch-pin working through a slot in the box. A motor casing is supported above the shutter box, and in this casing is located clock-mechanism, a rotating trip-dial, carrying trip-plugs being mounted on one of the shafts of the latter mechanism. Separate catch devices are arranged to engage the catch-pin at different points and suitably arranged trip-levers are adapted to be engaged by the trip-plugs of the trip-dial and have operating connections with the catch devices.

No. 573,521. Photographic Printing Frame. A. C. Moore and S. McLaughlin, Los Angeles, Cal.

A plate-glass frame provided with a glass-plate is hinged and pivoted at one edge to one side of a suitable

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bed and provided on its other edge with a pivoted stud. A hasp is fastened to the bed and provided with a hole to fit upon the pivot stud. A suitable bed-plate is arranged in the bed to move toward and from the glass, and means are provided for forcing the bed-plate toward the glass.

No. 573,888. Developing Tray. E. L. C. Lambert, Boulogne, France.

A developing tray is formed of a bottom plate having a rim about and beyond its edge, said rim being provided with a returned flange in substantially the same vertical plane with the margin of the bottom and forming a reservoir beyond the latter and extending therearound. The space within the returned edge is free for the insertion or removal of the photographic plate.

No, 574,054. Magic Lantern. T. S. Barbour, Elizabethtown, N. J.

In connection with the lens tube of a magic lantern the inventor employs a carrier case containing slide space for three slides end to end Suitable mechanism is provided for the operation of the parts.

No. 574,059. Sensitive Photographic Paper. F. H. Csiszar, Vienna, Austria-Hungary.

This is a process of making photographic silver-salt papers consisting in adding to the well-known silver preparations, such as collodion-silver-chloride emulsion, a weakening or retarding substance such as ferricyanide.

No. 574,069. Process of Producing Photographs in Relief. T. C. Marceau, San Francisco, Cal.

This method of forming pictures in relief consists in simultaneously cutting the outline of one of the pictures and a supplemental sheet upon which it is overlaid, fixing the sheet, and indicating the outline on a prepared block. An intaglio is then engraved in the block, corresponding with the outline, and the pictures are applied to register with the engraved portion. The coincident portions are finally pressed into the engraved surface.

No. 574,113. Photographic Shutter. J. A. Robertson, Rochester, N. Y.

A revolving apertured disk having lugs on the periphery is employed in connection with the front and lens of a photographic camera, a spring being encentrically pivoted at one end to said disk, its other end being secured to said camera front. A movable catch provided with a suitable detent is designed to engage said lugs.

No. 574,214. Lantern Slide Mat. W. H. Olmsted, Syracuse, N. Y.

A lantern slide mat is formed of a rectangular sheet of opaque material having a series of lines crossing each other at right angles and parallel with the edges of the sheet, whereby a guide for cutting rectangular openings is formed. A series of concentric circular lines are marked on this surface and centered on the center of the sheet, to form a guide for cutting circular openings or in conjunction with the rectangular lines to form a guide for cutting oval openings or openings with rounded corners.

Design Patent 26,427, issued to P. J. Stuparich, San Francisco, Cal., for Photographic Card Mount.

Certificate of Trade Mark Registration 29,394, was issued to A. Lumière & Ses Fils, Lyons, France, for the word "Cinématographe," applied to apparatus for photographically exhibiting objects in motion.

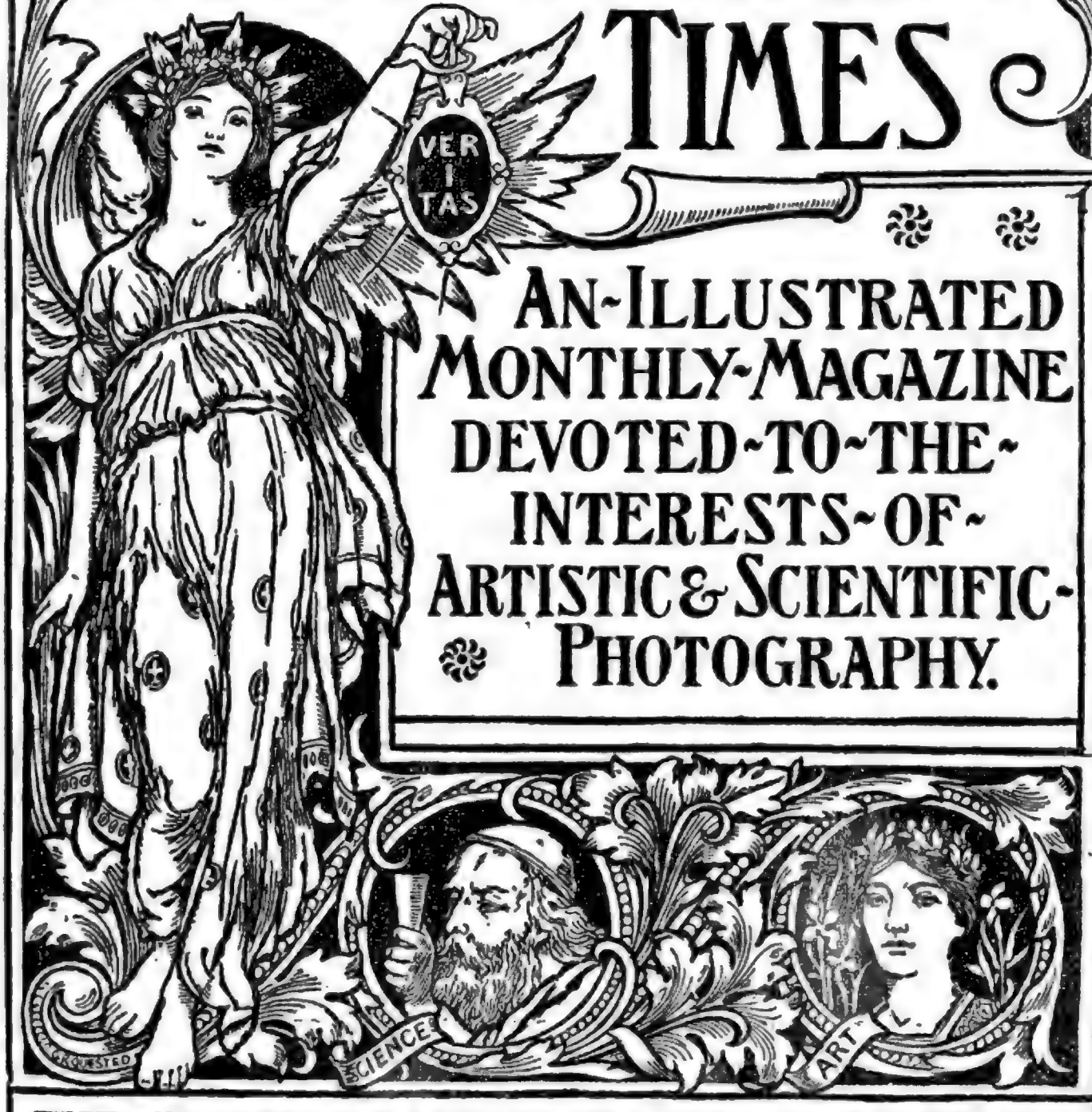


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THE PHOTOGRAPHIC TIMES



AN-ILLUSTRATED MONTHLY-MAGAZINE DEVOTED-TO-THE-INTERESTS-OF-ARTISTIC & SCIENTIFIC-PHOTOGRAPHY.

THE-PHOTOGRAPHIC-TIMES-PUBLISHING-ASSOCIATION-60-AND-62-EAST-11TH-ST.-NEW-YORK.

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THE PHOTOGRAPHIC TIMES.

VOL. XXIX. MARCH, 1897. NO. 3.

AUTOBIOGRAPHICAL SKETCHES.

BY H. P. ROBINSON.

CHAPTER II.

"But truths, on which depend our main concern,
That 'tis our shame and misery not to learn,
Shine by the side of every path we tread."—COWPER.



H. P. ROBINSON 1840 FROM A MINIATURE

WHEN I arrived at my thirteenth birthday I had been to school seven years and as I knew a bit of Latin, and could repeat a collect, it was decided that my schooleducation was complete. I fancy that a good many men of my time, and now of apparently liberal education, had to be content with no more school training than fell to me. People are now educated within an inch of their lives, and, as a rule, those who survive have very little to show for it.

My *real* education now began.

My attainments at this time were very scant; I had, however, very little to unlearn, that most difficult preparation for education. Modern languages, the sciences, or drawing were never heard of in my school, or, indeed, in any school in the town, but I was not without another kind of knowledge; I could distinguish between Upper and Lower Silurian rocks and old red sandstone; know most of the common wild-flowers, and could even name the bones and outer muscles of the human body; could dress a fly, and stuff a bird, as well as set a moth. I could draw long before I could write, and could now sketch fairly well from nature, and give a good idea of a likeness in pencil. I also remember that I had read several of Shakespeare's plays, and some of the Waverly novels, and had tried to write a story. It was "The History of a Mad Dog," and was very rabid.

"In order" said Fadladeen, importantly, "to convey with clearness my opinion of the story this young man has related, it is necessary to take a review of all the stories that have ever ——," but the princess, interupting exclaimed, "My good Fadladeen, we really do not deserve you should give yourself so much trouble.

Now I have only just begun to relate this present narrative, and can afford to spare you a Fadladeen infliction at present, but a glance at the state of art and culture in a remote country town during the forties, and before the great exhibition in 1851 had shed its beneficent influence over the world, may help us to understand how a very little deviation from "the trivial round, the common task," went a long way towards calling attention to any one of a small community, and I began to be noticed, even so early, for the portfolio under my arm.

In 1843 there was not a School of Art in all the land, *now* drawing is looked upon as of almost as great importance as reading and writing; *then* science was unknown away from the large towns, in our time there are technical classes

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"MAY ON THE TEME" PHOTOGRAPHED BY LORD MAITLAND

in every village We were not without teachers but their teachings seldom went beyond accomplishments; and what was accomplished beyond Berlin-wool work and embroidery consisted of pencil copies of impossible heads and classical landscapes on smooth Bristol board, and water color drawings of distorted flowers. In the practice of art the most stupid conventionalities prevailed over nature; the straight stalk of a flower was always made to curve according to the line of beauty, for nothing must be ungraceful, and grace was a system of curves.

Although few cared for the graphic arts or could see much use in them, other studies were carried on to an unusual extent. Some practiced music to a debilitating degree, and unfitted themselves for the sterner duties of life; every young man played the flute, and everyone acknowledged the connection between virtue and flute-playing; the instrument is neglected in these rapid times, and perhaps the virtue. The sound of the cornet was usually to be heard on "The Hill" at night, it being too noisy an instrument for the house in a small town; there was not a piano in every dwelling as is the modern custom, but there were a few in the town. My mother's was an old square, not unlike a harpsichord, but was the best to be borrowed when traveling singers came to give an entertainment. Lending the piano led to me getting free passes when anything good visited our neighborhood. Many famous singers and musicians found their way to Ludlow, and I particularly remember the despair of the popular John Barry when he failed to extract anything approaching the expression he wanted out of the old instrument. We were all musical My father was famous for his singing of patriotic songs. It was a town that was always expressing its loyalty, and we were ready to roast an ox in the Castle Green on any occasion: I still remember the Coronation Ox, with its gilded horns. Patriotic songs were much in favor, and we can scarcely imagine now the excitement that was aroused by the competent singing of such rousing songs as "My Ancestors were Englishmen," and "The Death of Nelson." They would be contemptuously referred to now as Jingoism. I should not be surprised if these songs had a serious influence on my after life. For years I "couldn't abide a foreigner." I know and appreciate them better now. It must be a judgment on me that I believe I have been better known for many years in almost any foreign country than in my native town, and I have had much the same experience as Mr. Punch's R. A., who when he visited the village in which he had spent his early life, was asked by his old love if he was still "fond of sketching."

Geology was a popular study. With our town built on Silurian rocks we had grand opportunities of studying that interesting system, and it was the effort of our students to obtain the



"THE HAY MILL," NEAR LUDLOW PHOTOGRAPHED BY SEYMOUR CONWAY

honor of having contributed rare specimens of fossils to the cases of the British Museum, with their names attached. Of local names attached to specimens, those of Harley and Marston will I think, be found most numerous in that institution, but a few specimens were provided by myself.

The study of Botany was greatly promoted by the character of the Nature surrounding the town, at least as regards wild flowers and ferns, and, to shorten the story, everything about the place conduced to the study and worship of what Wordsworth calls "the unassuming commonplaces of nature."

There is one other study I must mention which helps on the road to art; I mean Architecture. With a magnificent castle containing examples of military architecture, from Saxon down to Elizabethan times; with the finest parochial church in England, showing every style at its best, from early English down to Tudor, how was it possible to escape the study of architecture? An acquaintance with architecture proved one of my turning points, as will be seen. All these studies have worked in with the more immediate objects of life, and been of great help in photography.

It was decided when I left school that I was to have one year with which to do as I liked, but put on my honor to do the best with the time that my conscience dictated; an unusual condition, but it turned out a wise one. It was a very trying one for me, for my conscience was not content to be a medium one. I was always wondering if I was justifying the trust. It has been a great satistaction to me in after life that in that year I laid the foundation of an education absolutely fitted to my needs.

The year began with mathematics, but having little or no help, I soon deviated into the subjects mentioned above, with far off glimpses of astronomy; such reading as I could get, prominent among the books available being the Elizabethan dramatists, and much old English poetry (the study of this branch of literature has been a delight to me ever since), and the Eighteenth century writers. Of course I devoted a good deal of time to drawing, painting, and artistic anatomy, and I think the first book I ever bought was a much worn copy of Pugh on "Muscular Action," illustrated with fine plates.

It is now time I related another of the fortunate accidents of my life. It all depended on going into a shop to buy a pencil. But before doing so I must have a short digression as in-

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troduction to this important part of my simple story. I never knew until I began to write these chapters how difficult it is to get on; everything seems to want explaining before it is told, and so much arises in the memory that can be of no general interest. But I will not be as minute as a recent Diarist, who publishes the date of every time he took a letter to post.

A feature of Ludlow was the large number of well-to-do people who lived there—those who some years earlier would have loved to plume themselves on being "persons of quality"—and in the streets, and even in the narrow lanes, were great Queen Anne and Georgian houses, apparently quite too large for their situation. It seems remarkable that such a number of aristocratic families should have collected together in a remote town, but to look for the causes would not be to our purpose here. Anyway, those of the inhabitants who had, perhaps, most to pride themselves upon, seemed best able to notice a young student who showed some earnestness, and it seems a curious mixture, that, during the time I was an apprentice to a bookseller and printer, as will be seen hereafter, I was often invited to the houses of that part of the town diffidently called "the nobility and gentry." They were of other use to me, however, than could be conveyed in a passing notice; several of them seriously furthered my education

One of them was Mr. Penwarne. He was a Cornishman, very retired, and had all his life been a student. There seemed to be no subject of which he had not some knowledge, above all he was an excellent artist. He had indeed, as Pepy's says of Evelyn in his "Diary," "most excellent discourse touching all manner of learning; wherein I find him a very fine gentleman, and particularly of painting." The story of his life would carry us back to those far off times we now treat as ancient history. He was born before Sir Joshua Reynolds died, was much assisted in his earlier studies by Opie, and was admitted as a student of the Royal Academy in 1809, when Benjamin West was President, and Fuseli, keeper. His father was an early patron and life-long friend of John Opie, the marvellous Cornish boy, who became a Royal Academician during the Presidency of Sir Joshua, and professor of painting to that institution. Mr. Penwarne had some singular peculiarities, one of which I may mention. When I called upon him, as I did almost daily for about eight years, he would immediately continue the discussion or argument we were engaged in on the previous day. When I went to see him after an absence of ten years, and we had neither seen or scarcely heard of each other all that time, he omitted the usual conventional preliminaries, and sat down in his old attitude, and continued the subject we were discussing when I left him ten years ago, as if it was only yesterday, and when I showed him some photographs, he fell to criticising the composition as though they were sketches done the previous day.

I really must return to the purchase of that pencil. Somewhere about 1843 I went into a shop to buy a pencil, and took with me a few sketches to show my friend, the stationer. One of our most popular residents, Captain Wellings by name, happened to come into the shop, and saw the sketches. I remember he patted me on the head, called me a good boy, and said some complimentary things about my poor efforts, and added to my stock of drawing materials, telling me to let him see a copy of a Julien's Head he also bought. The copy was ready in a few days, and he took me to his brother-in-law, Mr. Penwarne. Thus the purchase of that pencil led to my introduction to the best imaginable friend for me at that period of my life. From that day for nearly eight years I took my work for Mr. Penwarne's criticism and advice, and during the last year I painted with him for two hours almost daily. I learned more than drawing from my old friend. I had the run of his library; he taught me the use of the lathe, and etching; his anecdotes of the painters he had known, especially Fuseli, and of society early in the century, were of absorbing interest; and an afternoon's fishing with him was an imposing demonstration. He was a scientific fisherman, and was always inventing ingenious engines to lure the wily trout. He habitually took a quantity of these with him, and when he was mounted on his old white pony, almost smothered in baskets, nets, and other impedi-ments, he exceed the picturesqueness of Dr. Syntax himself.

I had still one other source of instruction. This was a young landscape painter who travelled much, but spent a good deal of his time in Ludlow. We were constant companions during the little time I had to spare when in bondage, and afterwards when I had more leisure. The days were longer than they are now; beginning earlier and lasting well into the night. William Gill was of a poetical sensitive nature which,

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afterwards, unfortunately, developed into mental trouble; he had good ideas about art, and was renowned for his playing on the small Welsh harp. With his help I made a harp myself, and the effect of the two played on the rocks in the middle of the running river at the Hay Mill, Downton, had a curiously wild effect. One year we spent a couple of months at that romantic spot, the picturesque beauty of which is well known to many photographers. I may say here that I gave up music early as too enervating.

One great fault of landscape painters at that time was that they seldom or never painted direct from nature. Every picture was reproduced from a sketch or sketches; sometimes slightly tinted with water-colors; at others, with the colors written on them, or marked with hieroglyphics to which there was a key. Gill was a delightful sketcher, but his paintings suffered from want of sufficient reference to nature, though his love of nature was just what I wanted as a counterpoise to balance the influence of Mr. Penwarne, who was strictly academic. The Memory also was used as a sketch book, and we used to practice 'remembering nature," and what is now called visualization. We would examine a view carefully in every detail, log it down in the memory, and at a future time, varying from a day to a month, make a sketch at home of what we remembered, afterwards taking the sketch to the view for correction. This not only practiced the memory, but led us to look into nature more minutely. The result of photography, or the study of nature for a special purpose, on my eyes is that I rarely see the color of nature without a special effort. I only see what I want or what will effect my work, but my pictorial memory is still strong

It was in the following year—1844—that, as far as I recollect, I first heard of photography. I have just a passing memory of the advertisement of Talbot's "Pencil of Nature." Another glimpse was a sore mysterious one, of which I wish I could remember more. It is a dim vision of a little house of glass, set up in the inner court of the castle, in which a Mr. Jones, brother of the janitor of the castle, was said to take portraits on little bits of silver plate. I have made many inquiries, but never heard of anybody having been taken, although I remember Mr. Jones. Then came a blank, and I recall no more of photography until about 1850, when Calotype was largely practiced, Daguerreotypes began to be plentiful, and Collodion had entered the experimental stages.



THREE ARTISTS OF THE BRUSH BY CARL WOLFF

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BY THE WAYSIDE. BY H. TROTH

ARCHITECTURAL PHOTOGRAPHY. BY H. C. DELERY.

Of all the different branches to which photography has been applied, both artistic and scientific, there is none to which it has rendered more service, and been of greater assistance than architecture.

Who is the artist, or draughtsman, however proficient he may be, that can reproduce, with all the fidelity and fineness of detail, the splendors of the architecture of the old world? The great gothic cathedrals, with their enormous masses relieved by their elaborate ornamentations, the severe chasteness of the Grecian temples, with their majestic symmetry, and all the work which marked the epochs of architectural evolution, may well be painted and engraved, but can never attain the correctness of perspective, that fullness of detail, and complete subordination of the detail to the general effect, such as a well made and carefully taken photograph.

And of what invaluable assistance is it not to the architect. Here he may have within his reach a magnificent panorama of the architectural world, and from this derive innumerable ideas, which will greatly aid him in his designs.

The student, too, can by its aid study all the masterpieces afforded by the different architectural evolutions, and from ages more favorable for their production than ours, bring together in intimate comparison examples of the different epochs, placing them side by side, and thereby gain an abundance of knowledge which otherwise would be impossible.

And even in our own modern times, what would there be to-day to remind us of the beauties of the Great World's Fair, with all its magnificent groupings of buildings and artistic statuary? It would soon be forgotten as a dream, but thanks to photography its images will be ever retained before our eyes. And yet,



MORESQUE BUILDING NEW ORLEANS, LA

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CITY HALL, NEW ORLEANS, LA

how few appreciate the labor represented by an architectural photograph. How few specimens are there in which the rules of perspective and art are properly followed; how few of these photographs are there in which these qualities are harmoniously combined? Let us stop and consider some of the essential requirements of an architectural photographer.

First, he should possess a camera which permits of a good swing-back and provided with a level, either spirit or plumb, preferably the latter, a rising and falling front, square bellows, sliding tripod and two lenses, a long focus and wide angle lens, and most of all a good percentage of brains and a knowledge of how to use them.

In preparing to take a picture, let us first study our subject, as an artist would his model, remembering that whilst he can move his sitter to assume any position which he may desire, we cannot shift our building, but must by careful study select a view which will show it to best advantage, and here we will find that a few feet difference in point of sight may change the entire character of the resultant picture.

Always take the best advantage afforded by the natural scenery which may surround our building, such as trees and the like, being careful, however, not to allow this to detract from the main object of our view.

Also pay a little attention to the sky; of course have clouds if possible; if they cannot be had by all means let the sky be clear white with just a little tint to avoid glareness. A dark and muddy sky will destroy the beauties of an architectural photograph, and many a building depends on its sky lines to give it grace and dignity. Mostly all edifices have one principal front with other minor ones. This front should be given the most important position, and here must be guarded against taking a point of sight, which, to bring out some unimportant feature, shows equal portions of both front and sides, making the corner a dividing line, as it were, and causing the building to assume a low and meaningless appearance. Above all, beware of the wide angle lens. A wide angle lens is a monstrosity, which, like a wild animal, should be carefully guarded, and used only when absolute necessity demands it, well knowing that harsh and violent perspective is always inharmonious, and it would be far better not to photograph at all than to reproduce a building which would be an abortion. In general on small buildings a view from the ground at about three or four times its height will be sufficient, but on the modern sky-scraper a point of sight should be taken about one-fourth of the height of the building. Yet remember there is no set rule, and we must in all cases be guided by circumstances and our judgment.

Lighting is also a most important factor, and should be given as much attention here as in the studio. A morning or evening sun will always give the best effect. A noonday sun produces long shadows, which should be avoided. It is always best, if possible, to have the principal front well lighted, so as to bring it into prominence, leaving the side in the shade, and thereby breaking the monotony too often seen in architectural photographs, having its two sides brilliantly lighted.

By all means let us avoid deep shadows. The artist will cry "This is not art," very true. But whilst we desire to be artistic we must not destroy the personality of our subject, and though the artist may have perfect license in



CHRIST CHURCH RECTORY, NEW ORLEANS, LA

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using deep shadows to give boldness and character to his work yet what an imperfect conception of a building would we have, if all the delicate details and ornamentation were obliterated by a mass of black. This would by no means render the architect's work as he intended it.

For the photographing of monuments, or very white buildings, a subdued light, such as when the sun is under a light cloud, is always to be desired. White objects when photographed in bright sunshine are apt to be "chalky," and when a clear sky serves as a background, no contrast appears between the object and sky, thereby affording no relief, but a flat meaningless reproduction of an otherwise good subject.

It will be found to best advantage to use a small diaphragm, in order to secure all the detail possible. Again we must differ from our artistic friend, but must insist that a blurred and indistinct rendering of an edifice is as distasteful to an architect, as a landscape showing the minutest details, even to the blades of grass, is to the artist.



A SOUTHERN HOME

And now a few words about interiors. Of course it is almost essential that they be taken with a wide angle lens, and for this reason should we exercise the greatest care.

First, allow the rooms to retain their everyday appearance; do not attempt to make up "as an actor" does for the stage. Of course certain changes are necessary to suit the circumstances.

Be careful not to place statuary, chairs and furniture, in the immediate foreground, as they would be unduly magnified and cause a very unpleasant effect.

Select a point of sight which affords the prettiest view, and avoid as much as possible placing the camera directly opposite windows and such like; a side light, or one coming from over either the right or left shoulder gives the best effect, but as is often the case, should there be openings which would throw an objectionable light, such as stand in front of the lens, cover these openings with some dark material from the outside, and after the exposure is made for the interior remove these coverings, and then make a short exposure such as would suit an out-of-door view.

In order to harmonize the light, dark objects should be placed where they can receive the strongest light, and bright ones made to relieve dark corners.

The nonhalation and orthochromatic plates, as now manufactured, will prove a boon to the photographer, but let him be careful lest he become negligent, depending too much on the capabilities of his plates, and introduce certain lighting which would mar the beauty of the interior and destroy its artistic qualities.

The architectural photographer must well bear in mind that to do justice to his calling it is not only necessary to plant his camera at random and expose his plates, which unfortunately too often happens. We have only to look to our architectural papers of to-day to see what an imperfect rendering is given to some of the most beautiful designs conceived by man. In our age of progress there seems to be an ever prompting desire to reach the end, no matter how attained, and some of the most splendid opportunities are lost for want of careful study.



"JUST LANDED" BY CHAS. E. FAIRMAN

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PHOTOGRAPHY ON A TOW-BOAT. BY ADELAIDE SKEEL.

It was Scarlet's idea to pass a whole day on a river tow-boat. Scarlet was an artist. Submit, her comrade, was only an amateur photographer. There was nothing Bohemian about Submit, she was scarcely an amateur at roughing it. Her appetite returned with regularity three times daily, she wanted napkins at every meal, and she liked a chair to sit on, whether in the woods or on a raft at sea, therefore she demurred at her friend's suggestion.

"There are apt to be dangerous people aboard a tow," she said. "Sometimes the crew mutiny and the pilot kills the captain with his boat hook."

"We might go armed with boat-hooks. I can use golf sticks and pruning shears and croquet mallets, it would not take long to learn how to fight with a new weapon," was the undaunted response.

"Tows are irresponsible crafts," continued the objection raiser, "they, doubtless, pretend to leave and arrive on schedule time, but, as a matter of fact, we had a man visiting us once who was just daft about river boats. He watched them all day from our windows, asking all manner of questions which we could not answer. He wrote catchy things for the papers, you know, and wanted material. One morn we missed him in his accustomed spot at the breakfast table, and to make matters worse, the maid told us she had found his room empty at six o'clock. We feared suicide, at the least, and were actually searching the shrubberies, when at noon he returned, absolutely spent, dragging himself along as if he had suddenly developed the worst case of nervous prostration."

"What had happened?"

"Nothing! He had waited on the shore since sunrise, breakfastless, for an up-going tow, and none had passed, although he had seen one each day from our window go by at seven. At half-past eleven, a fisherman who had been watching him all the time, volunteered the somewhat belated information that the tow had slipped along at 3 A.M., the tide being with her and the wind fair."

"Well?"

"It wasn't well at all."

"No?"

A long pause followed this rather plotless tale, then Submit began again: "How should we get aboard? Tows make few landings and I could not swim out to one without wetting my plates."

"We must ask Trumpery as he has a row-boat, and, besides, he can defend us in case we find the vessel manned by pirates."

Trumpery was a fourteen year old boy with a kodak. Had he known more he would have known less, used up fewer films, and not got half as much fun out of his toy-box. He was christened from the fact that he always wanted to accompany the artist and the amateur, regardless of spoiling company by so doing. In the present case there would, however, have been no company without his escort and his boat. By his advice the trio took an early morning steamer from Newburgh to Low-Point, where they landed, to embark from the gray wharf, in the row-boat, to board a south-bound tow in mid-river. It was something like being wrecked and rescued by a life-boat with the conditions reversed. The tow they approached was a village in itself, consisting of many canal-boats, harnessed four abreast, headed by hay barges, the whole drawn by three brave little steam propellers.

"O, let me take it all!" Submit cried, forgetting her incipient sea-sickness in the ever new delight of her art

"All aboard," shouted the captain cheerily, before she had chosen a point of view. Trumpery had reeled three films off his spool, without the least hesitation. It is a fine thing to be young and quite free from the task of enlightening a waiting world Kodaking is not an art, as all know, but a pastime with which to amuse one's indulgent friends.

One gets aboard a canal-boat by climbing a bias board technically called a fender up its side, a dangerous walk with water below and outstretched hands above, yet the two girls accomplished the ascent, in their short bicycle skirts and reached the level unrailed deck, all jubilant with enthusiasm. The scene before their eyes was as peaceful as any one might see in a country village or on an unabandoned farm. There were men chopping wood, children playing with dolls, boys fishing off the side, a sailor drawing water in a bucket, a cat looking vainly for dock rats, a hen cackling as if she had laid her egg in an ordinary barn-yard, an old white horse sticking out his nose from a cabin window to be fed, a woman hanging her clothes on a line, literally a wet sheet in a stiff breeze. One looks across the boats floating abreast, then backward at others,

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alike and yet unlike, each teeming with its own individuality, and again, forward to the steamers far ahead in the river. The Hudson's banks were aglow with the autumnal foliage; the day was perfect.

"Life on a tow is surely a time exposure," Submit said at last.

"A day aboard reminds one in length of those of creation, of which Moses wrote in the book of Genesis," Scarlet rejoined, getting out her palette and beginning to mix her colors. Her Rationalism fell on deaf ears, for Submit was in the delightful inceptive frenzy of choosing what she should take. There were pictures on every side and she turned in despair to the boy.

"I'm goin' to get the engine, hooray," was his quick answer, and in a twinkling he was off. In another twinkling, however, he was back.

"Come, come," he urged, "it's bully, and I told the engineer you could call anybody down in this business, you bet!"

The compliment was an alluring bait, but the walk from boat to boat fearsome.

"A passage perilous maketh a port pleasant," Submit thought, as she stepped over narrow bridges and dangled her traps in mid-air. There was never a hand-rail to clutch, never a gang plank wider than her number two shoe, yet she reached the engine at last.

"Do you expect me to take this?" she cried, in dismay, looking into a yawning cavern, and wondering if Trumpery supposed her to be able to work miracles. "It would need a flash," she explained to the man apologetically. He was a grimy fellow, but through the coal dust his face showed unmistakeable signs of disappointment. A man's engine is his sweetheart and he had hoped great results from the lady's call.

"I snapped twice," the boy said, triumphantly, "and I'll get something, sure."

They returned to Scarlet and found her eating lunch. It was half-past nine by the clock, but five in the afternoon by the appetite. A rather pretty woman came forward and offered to make tea for them, adding there was a cow aboard which could be milked if need be. The party declined gracefully and immediately regretted their decision.

Later, there came up through the hatchway an overpowering bouquet of cabbage, which made Submit quite ill. The thin veneering of Bohemianism she had assumed was wearing off and she wanted to go home. To this, however, the other two objected. Trumpery had a boy's whole day's play before him. He had a hundred things to do and twice a hundred questions to ask, while Scarlet had only begun her first little sketch. She had enough studies to fill a week, she said, more than enough. Couldn't Submit go away somewhere and try a rest cure all by herself? Surely never were conditions more favorable. The motion was scarcely perceptible, the tow moved, as the earth moves but no one realized it. The sun was warm, one could lie down and think of nothing, what better?

Submit took the hint and went away to another boat to try it, with her usual success, since rest with her was change of action rather than cessation. She coaxed two little children to her side and told them fairy stories. She learned the whole heart history of their mother, she promised to send more pictures to the father than she had plates, she made herself immensely agreeable for half an hour, then, she returned to bother the artist, but Scarlet had secured a woman to pose and was totally oblivious to all else.

"I have had such fun over there," Submit said. "Are those people friends of yours?"—this to the posing model.

"No, ma'am," very decidedly, "we never visit across. We are not sure what sort of folks are in the tow when we make up in New York. We break up in Albany, and it's safer not to have been too friendly."

"Unneighborly neighbors, eh?"

"We have lived five years on a tow, my husband and I," was the stolid reply." We can't afford to take no risks with speaking to strangers unless if so be we get introduced."

"It would not be a bad plan if villages, after a winter of sewing societies and gossip, could break up," Submit said, under her breath, but the noon-hour was coming and the model must be off. She refused a bit of silver indignantly, then, with much courtesy, asked the ladies into her cabin. "It is small, but tidy," she said, and so the tourists found it, as snug a berth as ever a Vanderbilt yacht boasted.

Two events, a tragedy and a comedy, broke the monotony of the short afternoon, before the party again took to their row-boat and pulled for the shore. The comedy was the arrival of a veritable "*Pinafore*" bum-boat, with bum-boat men instead of bum-boat women aboard, offering their wares in most tempting fashion. No crowd at a bargain counter ever showed more enthusiasm than the tow-boat

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population. The wood-choppers stopped chopping, the pilot turned his head away from his compass, the engineer forgot to shovel coal into his furnace, the small boys dropped their fishing-lines, the woman left her wet sheet to flap unpinned in the stiff breeze, the hen ceased cackling over the egg she had not laid, and the horse lost hope of being fed till the excitement was over. Trumpery gallantly bought his "lady friends,"—pardon the phrase, it was his own, not mine—a bunch of dead ripe bananas and six chocolate mice on a string. Submit gave the candy to the children, while Scarlet munched the fruit, without stopping her sketch of this novel form of commerce.

"Sometimes it's our only chance to buy our supplies," a woman told her, but a man standing near, with a man's lack of appreciation of a woman's keenest delights, added masterfully, "And should we be after dropping anchor at every village alongshore? By gosh! there would be money spent like as if it grew, if we let our wives run into all the shops in the river-towns."

The tragedy came quickly now. The wife addressed disappeared down the companionway, leaving two small children, a boy in dresses and a girl, looking over the boat's edge to wistfully watch the departing of the bum-boat. Submit heard the mother call, but no call was as alluring as the sight upon which their eyes yet feasted. Evidently the boy in dresses had a woman's taste as well as a woman's costume.

"Me buy more," he lisped, his mouth full of the chocolate mice so liberally given him.

"Me go after boat," the larger child said, when suiting the action to the words, the wish to the fulfilment, she leaned over the deck, lost her balance, and fell without a word or warning into the river.

A shriek went up from all the men and women present, a shriek followed by a stillness, then a sailor produced the dreaded boat-hook, and in another minute the little girl was fished up and laid wet and dripping back on the deck. This was all, but it was enough.

"Did you snap on it?" Trumpery asked. Trumpery was a boy without nerves. The rescued child's father was also a man without nerves, for after carrying his daughter below to his wife, he returned to his wood-chopping on deck without speaking a word to any one. It may be chopping wood quiets the nerves.

In the twilight the visitors bade farewell to their generous hosts and hostesses, full of regret to bring such an unusual day to an end.

"Goodbye," the trio cried in chorus.

"Send us your *picters*," a woman called after them.

"Don't write about us in the papers," a man added.

"We will."

"We won't."

And they did and they didn't.



FALLS AT SHORT CREEK, NULTALLBURG. BY FRED R. RAVEN

"Not a few photographers have the idea that the laws of composition are formulæ whereby pictures can be made. This is no more the case than the laws of syntax and prosody are receipts for making poetry. If pictures were made like puddings, by receipt, there would be no art required."—*The Amateur Photographer.*

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THUNDER AND LIGHTNING. BY EVELYN P. SPERRY.

LIGHTNING in photography is, to many, a very interesting study—and I can certainly say that I am one of that many—as the interested party is in constant expectation of securing a plate showing peculiarities hitherto unknown to him.

In it, there is, of course, the element of chance; for the old saying is to a great extent true that "lightning never strikes twice in the same place" because, as our Celtic friend explained, "It niver laves onything to stroike."



FIG. 1

However, I think it may be said in this case, as in many others, that chance and judgment, to a certain degree, go hand in hand, as a good "lightning plate" is among the possibilities.

Owing to the fact that a thunder storm has a clearing effect upon the air, I always make a flank movement and attack the storm from behind, cowardly as it may seem, opening my batteries upon the rear ranks which in all cases are of the brightest and longest.

It is needless to say that this is done in the darkness of night made darker by the straggling clouds that consider it their duty to weep more or less over any damage the lightning may or might have done, thus bringing a solace to the general mind; the assurance that upon the following morning the leaves will be greener, the birds will sing sweeter, and—pardon my digression—the street crossings will to some extent be cleaned by Dame Nature, who does not always wait for the too often tardy movements of the street cleaning department.

After the fiercest of the storm has passed over, and one is installed in a dry place in the open air (dry, more on account of the camera than himself) with the front of the camera elevated to cut off as much of the foreground as seems necessary, with the lens pointed at the field in the heavens most likely to bring results, and, with the shutter open to catch the flash, he then, like Micawber, must "wait for something to turn up."

Setting up two or more cameras with the field of one over lapping that of the next, enhances the possibilities of success.

The first print given herewith is from a plate I obtained in the above manner, and it will show, upon close observation, that the camera was moved vertically (accidently in this case) during the exceedingly short time which elapsed between the first and second flashes; fortunately or unfortunately, be that as it may, it shows that there were two flashes and that both bolts went in



FIG. 2.

the same course as far as could be observed by the camera; this may be proved by comparing the distance of the movement of the camera upon the shed in the foreground with that of any horizontal portion of the bolt, but there is no way of telling, as far as my experiments extend as yet, whether both both bolts went in the same direction; however, as far as I could tell from observation at the time, I should say

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that the first one went down and the second one went up.

The laterals, I have every reason to believe, came, some with the first and some with the second flash.

The companion print is from a plate taken from the same point during the daylight to show comparative sizes.

The third print is from a plate which I obtained purely by chance, as the bolt went from one cloud to another nearly overhead, and I can also say that it was the cause (as my sister used to say) of "hot chills running down my back," as



FIG. 3.

the flash and report came simultaneously. The reason, to me, that this plate recommends itself for special notice is the fact of the clearness with which it shows the peculiar ribbon form which lightning sometimes assumes.

One of the laterals shows it to a slight degree, but upon the bolt itself the interest on this account would center itself. I regret that the flash more than covered the plate and I think quite a little more.

There need be no great fear of fogging a very sensitive plate by flashes outside the field, or even in the field if behind a cloud, as several of such will not effect it.

The first-mentioned plate was taken at eight-thirty o'clock P.M. in September.

The report was ten seconds reaching the ear; the height of the flash was twenty-two degrees; the distance to the bolt was about two miles; and the length of the bolt was about 4,055 feet.

The above results were obtained as follows:—I set up my camera ten feet from, and facing, a wall, which made the circle of observation, if extended, twenty feet in diameter as the camera was in the centre, so by multiplying twenty feet by 3.1416 I found the circumference of the circle to be nearly sixty-three feet; dividing this by 360 I found a degree of the circle to be about .2 of a foot.

I found by actual measurement that the plate took in seven feet of space on the wall, perpendicularly, and dividing it by .2 of a foot I found that the space covered in that or any other field by a plate in that camera was 35 degrees, and as the flash covered 22/35ths of the plate I knew that it was 22 degrees long.

With the fact that the report reached the ear in ten seconds, and that sound travels at the rate of 1,087 feet per second, it is evident that the bolt was 10,870 feet (or about two miles) from the camera. This would, therefore, make the circle of observation four miles in diameter, and the circumference a little over twelve and half miles, and one degree would be about .035 of a mile. The bolt being 22 degrees long would consequently be 22 times .035 of a mile, or about .77 of a mile (which is about 4,055 feet) long.

The laterals mentioned above were to me a feature of lightning never before observed, but the quick, true, and never failing eye of the camera saw what was impossible for the human eye to detect, and made record of a fact that was so plain yet so concealed.

"THE student may at first feel disheartened at his ill success in the imitation of nature, but whatever he does in obedience to her precepts will be infinitely superior to anything which he himself could conceive. . . . All standard rules are useless without constant study in the school of nature."—*J. W. Carmichael, Marine Painter.*

"SKY effects of some sort or another, the photographic beginner must have in his pictures if he is to represent, in ever so poor a degree, *anything* of the spirit of a scene."—*Rev. A. H. Blake, M.A., Photographer.*

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TINTING LANTERN SLIDES. AN EASY PROCESS. BY J. WILL BARBOUR.

No little skill is required to apply colors to lantern slides in the regular way, as brush marks and other defects, although not noticeable when the slide itself is viewed, becomes glaringly so when the enlarged image is thrown upon the screen.

Thus for fear of spoiling instead of improving slides that look very well as they are, lanternists hesitate before experimenting in this direction.

But there is a method that is very easy, and in my hands, at least, has given quite satisfactory results. From the manner in which the colors are applied, I call it the "three finger" process.

I do not work directly on the film of the photo image, but without disturbing the make-up of the mounted and bound slide, I apply the paint to the outside faces. A good red, blue, and yellow are all the colors required, as secondary colors can be produced by applying coats of the primaries on opposite sides of the slide.



PORTRAIT STUDY BY J. CRAIG ANNAN

To illustrate: We will take a good uncolored slide, which will be, for example, the well-known Bible view of Hofmann's "Sermon on the Mount."

Our three colors, Prussian blue, scarlet lake, and yellow lake, all oil colors that are easily obtained, are spread on our pallet, and the finger tip of the first finger charged with the blue.

Holding the slide with a piece of white paper so arranged behind it as to reflect the light through it to the eye, the color is evenly stamped in a thin coating over the sky, and also over the foliage of the large tree in the shade of which Christ is represented as seated teaching the multitude.

The tufts of grass that are in the picture are also touched with blue, and also such of the clothing of the figures as is intended to be blue, green, or purple.

The second finger is now charged with yellow and the slide turned over, and on the opposite side the yellow is stumped on the foliage of the tree, which with the blue on the other side now transmits the desired green.

Also down the tree trunk, and over the grass, ground, and rocks. Also a slight tint to all the flesh that is in the picture. As we go along, the outlines of any color that has overlapped in stumping can be worked into shape by that simple but effective little tool, the chewed end of a match stick. The third finger is now charged with the red, and on the surface on which the blue was stumped a thin coat is applied to the flesh which with the yellow on the other side is now of the desired tint.

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A little is also put on the tree trunk, ground, and rocks, which are thereby brought to the desired tints of brown. The costumes are then gone over with the different tints to suit the fancy, and the work is done.

The whole thing has taken but a few minutes, and, if on examination, the effect is not what is desired, it can be rubbed off and tried over again. When the slide itself is viewed the coatings of paint may seem to lack smoothness of texture on account of the marks left by the roughness of the skin of the finger tip; but as the paint is the thickness of the glass from the plane of the photo image, when the latter is focused on the screen, the paint is enough out of focus to blend it into a soft and even tint.

Of course slides prepared in this way must be carefully handled, as the paint being unprotected is easily scratched in handling; but if scuffed or scratched the paint can be wiped off with a little turpentine, and a new coating put on in a few minutes.

It should be remembered that slides intended for an oil light lantern should be painted by the same colored light as that by which they are to be shown—that is either by an oil lamp or gas.

Slides painted by day light show all right by lime or any other white light, but give disappointing results if thrown on the screen by a yellowish flame.

FILMS. BY C. FRANCIS JENKINS.

To develop films, as are now commonly known the celluloid strips used in the phantoscope, cinemetograph, vitascope, eidoloscope, kinetograph, animatoscope, photophone, kinetoscope, kinetophone, veriscope, etc., etc., the writer, for his own use, devised the following methods.

The first, and, except for the bulky and inconvenient shape, the best, is the long tray. The work turned out in this tray cannot be excelled by any other method. For a standard film a tray some 20 feet long, 2 inches wide and 2 inches deep is required. Two or more of these are sometimes arranged side by side, or, which is the same thing, a wide tray fitted with partitions, dividing it into several like trays. Above the tray is arranged a sprocket wheel for feeding the film through the developer. After putting the film in the tray, dry, the ends are joined so as to make an endless band of it, and when the sprocket is started the developer is poured in. A light is conveniently hung where the film can be examined from time to time.

A second method, which has the advantage of being very small and convenient, is the spool device shown. Two deep-flanged spools



FIG. 1.

are supported above the tray, the film being kept in the developer by passing under bent wire pieces. The film, dry, is wound upon one of the spools, and the end, after being passed under the two wires, is fastened to the other spool. The tray is filled with clear water and the wires pressed down so as to bring the film into the water. The empty spool is now rotated slowly, so that the film is thoroughly saturated as it is drawn through the water. The tray is emptied and developer poured in and the tray replaced. The film should be run rapidly through the developer, especially at the beginning of development. Washing and fixing is done in the same manner. This developing

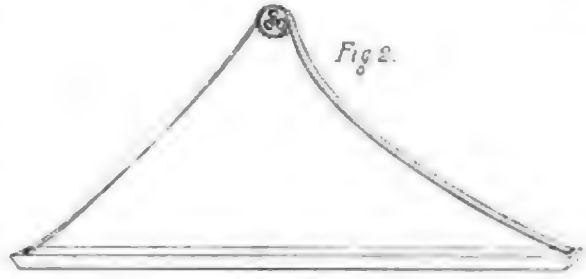


FIG. 2.

device is very convenient for developing any width of film, and has been adopted by some photographers who use it to develop uncut films other than phantoscope films.

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But the most satisfactory method of developing these long lengths of film is by means of large cylinders, supported in large semi-cylindrical trays. One end of the film is fastened to the circumference of the cylinder near the end, and as the cylinder is slowly turned the film is laid on, spirally. The drum shown will accommodate a film 1⅜ inches wide by 100 feet long. The drum is rotated and the developer poured into the tray. The last end of the film laid on is loose and can be picked up at any time, so that the progress of development can be determined by examining the film before a conveniently located light. After developing and washing the film is led onto a second cylinder, where it is passed through hypo until thor-



FIG. 3.

oughly fixed. It is then led onto still another cylinder, for hardening and final washing. Each cylinder is rotated by means of a motor, and in actual practice it is found to be less tedious to develop, fix, and wash 100 feet of film than half a dozen plates.

The films range in length from 50 feet upward, a 50-foot film now being generally considered a standard length. They can, however, be made in any desired length, the writer having made special subject films for a five-minute exhibition. The pictures are ¾ inch by ⅞ inch, the latter dimension being the width of the picture, *i.e.*, across the film. The pictures were put upon the film, by the camera, at a rate of about 30 to 40 per second, usually; 16 pictures per foot, a 50-foot film containing, therefore, eight hundred pictures. The retail price of finished positive films ranges from 25 to 50 cents per foot.

A FEW NOTES BY VAL STARNES.

It is not, I think, an exaggeration to assert that "The Photographic Times Annual" for 1897, far surpasses anything of the kind that has hitherto been laid before the public. Moreover, to the close observer, an examination of its pages evidences a decided leaning on the part of photographers toward making their pictures tell some story.

This is a marked improvement over former methods, and the tendency should in every way be encouraged. And yet it is a matter that admits of a note of warning being sounded in regard to it. For while The Times, of course, has superior opportunities, and can make selection only of the best, the ordinary photographer must bear in mind that to successfully attain the end in view requires something more than good intentions, something more even than the additional necessary artistic perception.

There may be a few fortunate individuals in these broad United States who possess models, costumes, draperies, and bric-a-brac suited to the subject that they wish to portray, and are even so favored as to have at hand correct architectural environment as well. The muster-roll of such, however, cannot be a long one, and, at any rate, the large majority of the members of the craft are not thus graciously regarded by the gods. My object is to remind the latter that one false note may destroy the harmony of the whole.

Let us suppose that you succeed perfectly in arranging your representation of forest scenery and moonlight, the ass's head upon Bottom's shoulders, and the gauzy wings and floating scarves of Titania. Of what profit is all that if the dainty fay herself be a fat and serious-faced matron of middle age?

Or your stout retainers of some bold robber baron may be harnessed in genuine ancient armor and look fierce and swart enough as they quaff the nut-brown ale from real old leathern "jacks." But if a modern glazed window, or a door with a Yale lock in plain view creeps into your background, "where"—in the language of my distinguished fellow-Georgian—"are you at?"

Or again: your Iphigenia may be "divinely" fair and tall, her stately figure clothed in raiment that is correct in fold and texture from shoulder plaque to skirt hem, while the piece of

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STUDIES

BY J. CRAIG ANNAN

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scenery, that does duty for the Grecian bay, may even deceive the practised eye in its simulation of the sun-kissed waves. But if the artist who painted the latter, with a view to general utility, happens to have introduced a *fin-de-siècle* steamboat amid the "tall masts that flickered as they lay afloat," the anachronism is doubly accentuated by the truthfulness of the rest of the composition, and your time and trouble are simply wasted so far as that negative is concerned.

Moreover, such efforts not only fall short of being perfect pictures, but are eminently ridiculous.

Let us, then, be sure that we can pose, costume, and environ, with absolute correctness, a model that looks the part before we rashly rush into—developer.

This, I admit, is hard to accomplish. So what is the natural conclusion? Merely, that we should not be too ambitious. Why not, in many instances, be content with some simple pictorial story of to-day and our respective localities? Bear in mind, that the humblest homes and the least artificial of out-of-door surroundings often present the choicest opportunities for picturesque camera sketches. Mr. Stieglitz's well-known "Winter, Fifth Avenue," and the picture that many will recall of a little tot peeping into a tall clock, and entitled, "Seeing the Wheels Go Round," are two excellent examples of what can be done along the line suggested.

Don't stop trying to make pictures and go back to reproducing microscopic detail of whatever happens to come before you—Heaven forfend that I should inculcate that for a moment! But be certain when you try to make a picture that it is, at least, truthful in all respects.

If that is impossible with subjects taken from history and fiction and the past, why try your hand at the present and the every-day life and landscapes that lie about you.

THE SNOW PLANT OF THE SIERRAS. BY I. H. FICKEL.

High up in the Sierra Nevada mountains the beautiful snow plant greets the weary traveler. Its birth place is beneath great banks of snow, which, melting away under the warm rays of the summer sun, soon shoots forth in strange contrast to its recent covering. The entire plant is rich blood red. It belongs to the sub-order *monotropeæ* and the species *sarcodes sanguinea*. It is so called with reference to its bright red fleshy stem and coral shaped roots. It is a native of the Sierra Nevada mountains in California, and



THE SNOW-PLANT

grows at elevations of 4,000 to 8,000 feet above the level, and is usually found in coniferous forests, especially those of the Sequoia or Big Trees. It is a parasitic plant and grows from eight to twelve inches high.

PHOTOGRAPHY AND ILLUSTRATION. BY VAL STARNES.

In the 1894 "Times Annual" I ventured the remark that the camera should be to the artist what the notebook is to the author. Of course this is still perfectly true, but it is merely a general assertion. My present purpose is to call attention to the advantages offered by the lens and sensitive plate to a certain class of artists—illustrators to wit—in laying in a stock of typical faces and figures that can be utilized according to the subject or locality of the picture that they have in hand.

Many of my readers have noticed, no doubt,

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that most of our prominent illustrators are inclined to draw but one or two faces. They may ring the changes upon these, and even at times somewhat disguise them by a difference in headgear or some trick of beard or whisker, but at bottom can always be recognized the same old, long-suffering countenance or countenances. For it is indisputable, I think, that the inability to give marked variety to the human features is a striking characteristic of draughtsmen.

For example there is a certain wielder of the brush and pencil who is frequently selected by the leading magazines to illustrate stories having to do with the South and the negro. The reason for this choice is simply inexplicable, since he can — or, what is the same thing, does — draw but one negro and one white face. Precisely the same features do duty impartially for the stately Virginia coachman, the suave mulatto Georgia butler, and the jet-black, simian-skulled Congo type of laborer in the Lousiana cane-fields; while as for his portrayal of the Southern Cauca-ian, from the courtly planters of *ante-bellum* times to the clay eating "crackers" of to-day, it is a weird, wild, indescribable conception, the like of which never had a place upon this earth, in the heavens above, or the waters below it.



EASTER MORNING BY DEXTER THURBER

This, to some, may appear to be a small matter, but it is not so unimportant after all, for it gives the reading public of the North and the West and the world at large, who have never visited the South, a totally false, and by no means flattering idea of the people, and one at which, if it produces prejudice, I at least can find no cause for wonder.

Now suppose the artist in question possessed a half-dozen 4 x 5, representative snap-shots of individuals, men, women, and children, and as many 5 x 7 groups of each color, taken in the same number (six) judiciously selected localities south of Mason and Dixon's line; would it not, at any rate, be a *prima facie* basis for more truthful and pleasing illustrations in at least one field of periodic literature?

If we could go still further and supply all illustrators with similar studies, extending their scope so that they embraced not only the people, but all peculiarities — flora, fauna, architecture, landscape, what not — of all climes and countries we would at once revolutionize the pictorial embellishment of all reading matter and serve the cause of universal education to an incalculable extent.

It is true that artists in their travels do jot down studies of all kinds; but it is the rapidest of mere outline work at the best; besides

which, here, too, established bias has to be reckoned with, for in such hasty sketching the pencil is apt to give, unconsciously, some evidence of preconceived ideas. Nor does any one artist cover sufficient ground.

The latter objection applies with equal force, of course, to the camera. But I see no reason why our prominent publishing houses and magazines could not undertake the larger task of collecting such photographic studies from all quarters, and provide themselves, so to speak, with libraries of negatives.

Or if this is too expensive and too extensive a scheme in its entirety, surely some effort might be made to overcome the difficulty, to a greater or less degree. For instance, when a publisher or editor decides upon illustrating a manuscript that is imbued with strong local color, let him communicate with a photographer in the immediate vicinity of the place where the scenes are laid, or where the views or objects of interests that are to be represented are to be found, and order just as many, or just as few negatives as he may wish, indicating exactly what he desires included therein. These negatives could then be utilized just as they stood, for half-tones, or turned over to a draughtsman to "work up," in either event storing them carefully away when done with, with an eye to future contingencies.

Such a course would necessarily be accompanied by some additional expense, but the vast improvement resulting therefrom would soon so increase the sale of the finished products as to speedily repay the outlay, and more besides.

The above appears to me to be an entirely feasible suggestion, and I only wish I were sanguine enough to hope that the autocrats of the sanctums and the proprietors of printing houses would give it the consideration it deserves. And if this attention led to any one of them adopting it, I am firmly convinced that he would find its result beneficially to himself, as well as to the photographers who might be patronized and the public who would profit by the perfected pictures.

"Upon the choice of a proper and judicious distance—meaning the distance intervening between the spectator's position and that point on the ground directly in front of him, where the picture that he is about to take ought properly to commence—the beauty of the artist's work will in a great measure depend."—*Thomas Rowbotham, Landscape Painter.*

A BELLEVUE TABLE. BY O. G. MASON.

In the early days of picture-making by light very few appliances were required for the work. The knowledge of the operator in the chemistry and optics of his profession was the result of personal experience, or the purchased formulas and observations of his co-workers, who were usually averse to *giving* instructions to those who were looked upon as competitors for the limited patronage of the public; but these conditions have greatly changed. The demands of modern photography are so multiform in the way of apparatus and appliances, that the gallery and work-rooms of a professional operator in our



FIG. 1.

department of science and art soon become crowded with the various articles which he requires for the convenient and expeditious accomplishment of his work, under the constantly changing conditions of subject, methods, and result sought. When the photographer begins his building plans he calculates how much space will be required for his instruments, his chemicals, and furniture. He usually makes scant provision for the increase of space which a growing business will soon demand. From time to time he finds that he *must* take up new and various lines of work not originally contemplated, and which competition forces him to adopt in order to hold his place; and if his mind be active, his inventive faculties lead him to constantly add new principles and means, until space once ample enough becomes inconveniently crowded. To remedy these conditions there are two methods—increase of room and diminution of contents.

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The first of these involves constant expense, and in many cases is rendered impracticable by surroundings, and that inevitable law which dictates the impossibility of space being occupied by two things at the same time. If there is to be a general clearing out of articles to gain room, *what* is to go? The Portrait Cameras, the View Cameras, the Microscopic Cameras,

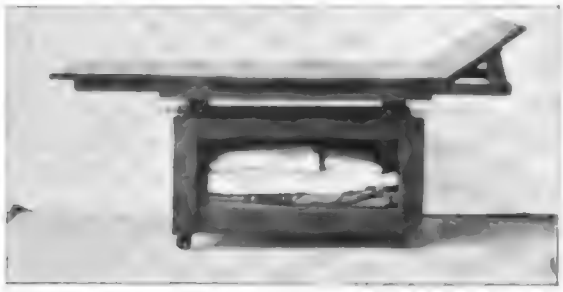


FIG. 2.

the Enlarging Apparatus, and the many attachments made for them, are any and all apt to be required the next day. The furnishings of chairs, tables, rests, screens, and the general fittings which are needed for the conduct of a live business most certainly must be kept; but there are many articles which are only *occasionally* required yet cannot be entirely dispensed with without great inconvenience, hence he must decrease the number and size of

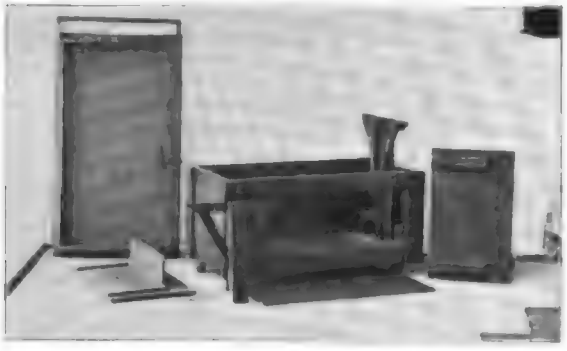


FIG. 3.

some of these, by making one fulfil the office of several without diminishing the working efficiency of any. A system of interchangeable parts and the compressing of much into little space will furnish means for relief. A table 30 x 48 inches is convenient in the operating or work-room, but it is not necessary to give up the room which it occupies to this one piece of furniture. It may be utilized for several equally useful purposes, as shown in the accompanying illustrations.

The table, covered by spread, on which are seen books, stereoscope, opera-glass, microscope, etc., contains *all* the articles and parts shown in the other illustrations. The general construction is seen where the several parts are separated. The T pieces fitted to hold the top are separately adjustable to height, either for level or angle position, and are held at the chosen elevation by ring pins, one of which is seen lying on the floor. Whenever a long table is required for mounting large prints or other work needing considerable space, the extension slides are drawn out and the short pieces laid on, making a seven foot table. One of these suspension supporters may be seen started out of the upper part of the top standing in the left background of one of the illustrations.



FIG. 4.

By elevating one of these extension ends by means of a hinged attachment which hooks firmly in place, the foundation for the pillow end of a good bed is formed as shown, while the addition of a flat board extends the foot end. The blankets, sheets, and pillows together with these extension pieces, when not in use, are stored away in the receptacle formed between the table legs proper, which is usually waste space. Little need be said about the utility of such furniture in a photographical establishment. A large table takes up a great amount of room, often required for other purposes, and a bed as a permanent piece of apparatus would have a queer look to many people, yet these are occasionally required for the production of satisfactory illustrations. Of course the bed drapery can be made as elaborate as the most fastidious mamma could desire for baby's picture, or as plain, simple, and unyielding as is sometimes necessary for the proper illus-

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tration of deformed and surgical cases. The whole device is strongly made and so plain as to have little or no liability of derangement. Mounting on heavy rollers makes it easily moved about even when loaded. Its compactness and ready adaptability to various uses during the last few years have proved it to be a valuable adjunct in the writer's practice.

SOME PRACTICAL NOTES. BY H. J. L. J. MASSE.

CURIOUSLY mottled markings, perfectly regular and symmetrical, extending over all the plate, sometimes occur during development. The cause would seem to be the leaving of the plate in the dish without any rocking. It is often said that there is no need to rock a plate if quinol be used, but a slight occasional movement of the dish will, at any rate, prevent any such markings.

WHEN negatives have accumulated up to a certain point, it is a good plan to go through them and pick out those that can be reduced to smaller size. Many half-plate negatives can be reduced to 5 by 4, or quarter-plate size, and the gain in storage capacity is a great consideration. There is no difficulty in cutting down the negatives, either with a wheel cutter or with a diamond, but it goes without saying that the diamond is the best and safest tool to use, especially as the thickness of glass varies very much, even in a set of one dozen. Before trying a wheel cutter on negative it will be as well to practice on some wasters. Experience is better bought than taught, but it is better to buy it on waste glass.

ONE of the reasons why bromide paper becomes stained in development is that the exposure was insufficient and the prolonged stay in the developer induces discoloration.

ONE is perpetually encountering suggestions as to the making of Christmas cards by the aid of photography, but the number of such cards directly produced in this way is very small. Of course, some localities are so void of interest that no Christmas card could possibly be made of any view. But there is no occasion why negatives should not be utilized in this way. Amateurs should remember that the earlier in the year the printing can be done the better, and the quicker will the work be got through if printing-out paper be chosen. On bromide paper the prints can be done almost at Christmas Eve, but, as a rule, there are other things to be done at that time.

FRILLING is often credited to the maker of the plates, but a little experiment on the part of the user of the plates will show where the fault lies. If the frilling takes place while the plate is in the developer, the fault may lie with the developer, or, at any rate, with the alkali. A caustic alkali is very apt to cause frilling, and more especially so in warm weather. If the frilling does not show itself till the plate is in the fixing-bath, there may be several reasons to account for it—the fixing-bath may be too cold, especially so if it has been freshly made up, and it may be too strong. The hypo may have been shoveled in hap-hazard. This excess of hypo in the bath is a very common fault and a very common cause of frilling. Water will take up a considerable amount of hypo, and the solution may very easily be made three or four times as strong as is really required for proper fixation.

COMBINED baths without gold are sometimes recommended, but they are probably recommended by those who wish to bring discredit upon all combined toning baths. There may be a spurious toning that takes place, but nothing more. The users of this kind of bath may save their gold, but they cannot save their prints—at any rate, for long. They may, however, be only experimenting.

A GLOSSY surface on prints will always be a *sine qua non* with some workers, and to secure a uniformly good result and a perfect surface very little care is required. Ferrotype plates (glued or cemented down on to cardboard to prevent damage to the thin iron) are perhaps the best medium, and are certainly cheaper than patent plate or other glass with a good level surface. The plate before use must be rubbed with a soft cloth and a few drops of pure oil, olive, or a little bit of encaustic cerate made of white wax and oil of lavender, or else spermaceti and benzine. All the oil or wax must be rubbed off again, at least to all appearance it is so rubbed off, but the slight film that does remain is the agent for obtaining the surface required on the prints. The prints when squeegeed on to the plate should be quite wet, and they must not be interfered with until they are dry enough to peel off by themselves. Care

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must be taken that no air bubbles are left between the print and the ferrotype plate, or an ugly place will be the result.

An enameled surface subsequently matted with powdered pumice stone gives an almost ideal surface. The loss of detail seems to be nothing compared with the loss suffered by printing-out on ordinary matt paper.

The secret of successful enameling is cleanliness in all the manipulations.

A single-solution developer for lantern slides is convenient at times, especially when one is in a hurry. The following gives capital results with all the well-known lantern plates at present sold, and yields clear high lights without clogging the shadows:

Dissolve two ounces of sodium sulphite in 15 ounces of water; then dissolve 30 gr. of hydroquinone in an ounce of alcohol, and add the solution gradually (with shaking) to the solution of sodium sulphite. Then add, in any order—

Potassium carbonate	2 ounces
Sodium carbonate	4 ounces
Potassium bromide	40 grains

Finally make up the bulk to twenty ounces with water. To each ounce of this developer add from 2 to 4 drm. of water.

Very few toning formulæ prescribe the use of tungstate of soda. An excellent formula is as follows:

Boiling water	15 oz., or 400 c.c.
Sodium tungstate	300 gr., or 20 grammes
Gold chloride	15 gr., or 1 gramme

For use, take one ounce of above—when cold, of course—and mix with 7 ounces of water. The tones, as a rule, are a good purple-brown. The bath will keep fairly well in a dark cupboard.

Ferrous oxalate development is probably practiced by very few workers nowadays, but the method certainly has its advantages. It is hardly a developer to recommend to beginners, but for those who know all about exposure (or think they do), a trial, merely for the sake of experiment, may be recommended. Hyposulphite of soda, if added in very minute quantities, acts as an accelerator. For bromide work there is nothing to touch ferrous oxalate, with the exception of metol. For lantern slides, too, the tone given by the iron developer is very charming.

Printing-out paper, if kept for any length of time, say, eighteen months or so, between the two pieces of strawboard usually put in as packing, will be found to be marked with a pattern evidently made by the material of the strawboard. Such markings, if on the back of the paper, do not show in the finished print. The other sheets may have gone somewhat at the edges, but this is immaterial, as the discolored portion will go when the trimming-knife begins its work.

Camera stands are of many kinds, and the only point in common is that they have three legs. The most convenient kind is that in which the camera screw is a fixture in the tripod head, and in which the legs fold up without being detached from the tripod-head at all. In this kind of stand there is no possibility of leaving the screw at home. For convenience in carrying, a handle of leather can be fitted on one of the legs when folded up, and the gain in comfort is very great. The three legs can be kept together by a stout rubber ring or else a small strap.

It is an excellent plan never to go out on a photographic jaunt without a piece of good string or cord. Water-cord (so-called because it is used for fishing lines) is very thin and strong. Recently while carrying a 12 by 10 kit over some hilly country, I used some strong strong cord to connect the two halves of the kit, carrying the cord ever my shoulders—milkman fashion. This method relieved the strain that fifty-six odd pounds put upon the arms, and distributed it over the shoulders. Of course, the cord did not take the whole weight, but it certainly relieved the feeling of fatigue.

Ivory insets with numbers are very convenient for numbering dark slides, but the numbers ought to be absolutely plain, legible, and free from ornament of any kind. When slides are numbered on one side 5, and on the other 6 (figures made in Germany), it is easy—*experto crede*—to make two exposures on one plate, more particularly if the upper portion of the 5 be badly engraved. A good plan to mark slides is to nick with a knife or a fretsaw the edge of the wooden piece which is held between the fingers to draw out the slide, giving one nick for slide one, and so forth. This method makes it easy to identify any given plate in a given slide in the dark recesses of a changing bag, or in the dark-room.

In a foreign exposure table (which I saw the other day) the *f* values were quite different to those in common use on this side of the Channel. There was, however, an interesting note

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saying that if the photographer who was using the table had a lens in use with different *f* values to those on the table, he could approximate to the proper exposure by adding the exposures assigned to the two *f* values nearest to that on his own lens, and halving the total thus obtained. Perhaps an instance will make this clearer. Supposing the table gives 1-10th of a second for a view in a good light using *f*/14, and 1-5th for *f*/20, the exposure for *f*/16 would be half of the sum of the two exposures thus given, or something between 1-6th and 1-7th of a second.—*The* (*London*) *Amateur Photographer*.

PHOTOGRAPHY NOT A LOST ART. BY P. YRO AND H. YPO.

EMPHATICALLY, photography is not a lost art. In fact, nothing in it is lost, except the time given and the money which you spend for the outfit; and the latter may be saved if you regulate Christmas presents, so that your boy's wish is to have a camera, which will compel you to buy him one. The camera can be of a nature that he should not use it until he grows old enough to know how to take proper care of it, if anything is left by that time. The plates, after you have used them, can be used for window glass. If they do not fit, the fault is with the window. The bottles—how handy they are!—what if you do forget which is the crome alum and which the hyposulphite of soda came in? You can throw away such as you are in doubt of. Any fool can do that, and you are not *any* fool; you are a particular one, like as not. Suppose the servant girl does find them, and carefully fill them with preserves? Next winter, when they come upon the table, you can refuse to eat the contents, and also have the pleasure of teaching your family the advisability of not yielding to every desire of the animal appetite, for this gives strength of character. You will have something to donate to your favorite charitable institution. This will give you a name for kindness to the poor.

What a pity that your wife will object to the sacrifice to art of your best trousers and her best china, which she has hardly used since you



SOMNEIL. BY C. PUYO.

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"A GOOD STORY"

BY C. PUYO

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were married. (We here refer to the china and not the trousers.) Remember, you are right. Let that brace you up, no matter what comes. "Brandy and Soda," in the usual proportions, is recommended also. This also can be used for exposures which you take with your hat off, while trying to catch the baby in those cute attitudes which he is always in—in the house.

This to the beginner. Don't be afraid to go into photography. Anyone, who has never tried it, can tell you how easy the whole thing is. Indeed, it is a simple matter to take pictures [ask any camera club member] when you find them in a book or on the table and no one is looking.



From Life

IN THE MARKET BY LAFAYETTE

Don't mind what people say. What do they know? And who are they? Have they ever looked through the works on the subject, or studied it as you have done while waiting for your package to be wrapped up at the stock dealers? I say NO, and make it plain, Mr. Printer, with a big N and a large O.

Like as not these same people, will not be able to tell your baby, in a picture of your taking, from the baby that belongs next door and which you borrowed for the occasion. Within your heart, at the bottom of your soul, feel sorry for them. They are to be more pitied than blamed. Don't tell them so, or they may say, "Yes, for having such a friend."

When your friend asks you to buy a camera for him, do so cheerfully. What matters it to you if he does complain of a scratch on the back of it, which has saved him half the price? Your day will come,—it may be a night; till then, tell him what he doesn't want to know. It will please him and relieve you. Avoid saying anything about the question of time, light, exposure, etc. Remember how little interest you took in these things when you began.

Should you chance to get something really good, don't say that it was by chance. (This has been known to break off a marriage engagement before now.) Instead, look wise, half close your eyes, elevate your chin, and let others feel that it was nothing for you to do and that you have many things which you have in mind that will surprise them more. You may hit it again. Your first plates were different, very different from these. Unfeeling and unartistic people did at the time say that they could see nothing in these plates, or in you. It mattered not. You bought those "six second plates" and have the clerk's word for it, that was the correct exposure. It was no fault of yours that your first interior turned out a failure.

A word about developers and we will finish this first "aid." We thought to omit this, but see, upon looking over our annuals, that there is need of our advice upon this point. We are not partial. You may not think so, but one is as bad as another to start with. We only insist, that it be *old*, the older the better. Logic says that if old is good, older must be better, and logic is a respectable person. If it is old enough and the room light enough you will get

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THE LONELY SHORE — BY H. TROTH

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IN THE MEADOW BY GEO. D. FIRMIN

as good results without a red light as with one. Try it. We have seen amateurs who were apt to mistake their developer for ink. Don't do so.

It is unprofessional and besides quite common with beginners. From frequent experience, we may say that the best time to try anything new is when a friend calls. Should you never have photographed lightning, do so the next time you have a friend and a storm. The friend is easier to get than the storm. He will give you good advice, this friend of yours, and if the results do not turn out well, you can blame it on him, supposing that the plates are not old. But supposing that you do get something. Do not look surprised, or, if you have to, do so in the dark room. It betokens a lack of confidence in yourself, and there is likely to be an over supply of that in the neighborhood; it is a drug in the market.

As we have got to photograph a baby out of doors, a dog in a house, and walk four miles to do it, with our watch standing at 4.30 P. M., we will now go to receive the gratitude of the mother (of the baby), and fix this right here with a period.



WAITING BY A. L. RIDEMILLER

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BECQUEREL RAYS.

Following out the experiment of Becquerel that certain uranium salts, after exposure to sunlight, emit radiations which like Rœntgen rays, are able to affect photographic plates with opaque material intervening, Prof. McKissick, of Auburn, Ala., has recently carried out a series of experiments, which led him to the belief that the Becquerel ray is the connecting link between the ordinary light and the Rœntgen ray.

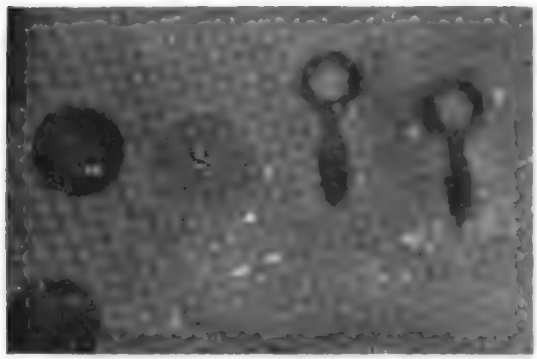


FIG. 1.

Prof. McKissick investigated the action of all the known phosphorescent and fluorescent compounds available and found that lithium chloride (in solution), barium sulphide, calcium sulphate, quinine chloride, quinine sulphate, calcium nitrate, chalk, glucose, sugar, sodium tungstate, sterein, uranium acetate, and ammonium-phospho-molybdate, give active photographic radiations after exposure to sunlight. To take the pictures the articles were placed in contact with the sensitive plate, and the substance, after exposure to sunlight for two hours, sprinkled over the plate holder. The whole was then enveloped in a dark cloth, so as to prevent the action of any external light on the plate. The plates used were "slow" (sensitometer No. 16). Ordinary developer was used and in some of the experiments the development required an exceedingly long time.

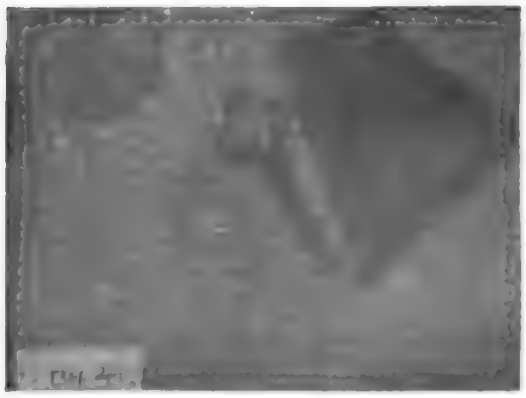


FIG. 2.

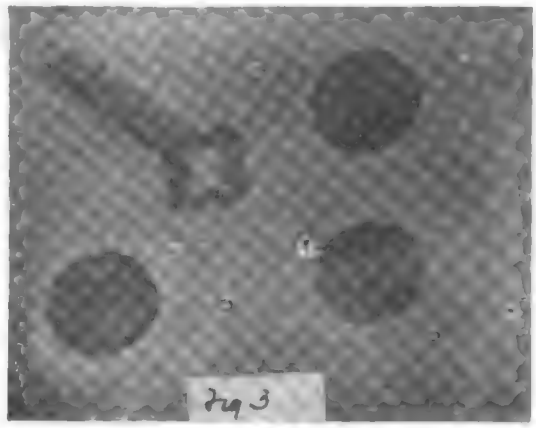


FIG. 3.

Figs. 1 and 2 are photographs reproduced of different articles taken with uranium nitrate, Fig. 1 being two keys and two copper cents, and Fig. 2 a piece of glass, a key, and two coins (a copper cent and a quarter). A very peculiar property of this radiation is that generally more than one image of an object is produced on the plate (although the object is in contact with the plate) as may be seen by closely inspecting the

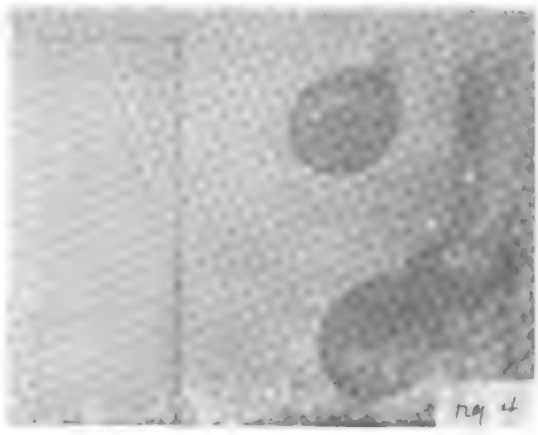


FIG. 4.

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photographs reproduced. For simplicity we may designate the sharper and more pronounced image the primary and the less distinct ones the secondary, being marked with the letter "S" in the center.

Of all the substances tried Prof. McKissick found that white granulated sugar gave the best results. Fig. 3 is a photograph of a key, three copper cents, and an irregular piece of glass (secondary images marked as usual with "S." Fig. 4 is a photograph of two coins, a key, and a piece of glass, sugar being used but acting through a piece of wood 2½ inches in thickness. In one negative Prof. McKissick noticed as many as five images of one object, and sometimes on the same negative there would be two images of one object and only one of another object only two inches away.

It was suggested by Prof. B. B. Ross that inasmuch as quite a number of fluorescent and phosphorescent substances possess high molecular weights, other substances of high molecular weights, although not known to be either fluorescent or phosphorescent, might give off these rays.



FIG. 5.

With this idea sterein and ammonium phospho-molybdate were tried, and both were found to give off Becquerel rays, the first, sterein, very slightly, the second, ammonium-phospho-molybdate, giving a fairly clear and sharp negative, as will be seen by inspecting Fig. 5, the articles being a piece of glass, two coins, and a key. The secondary images are marked as usual with the letter "S," that of the key being rotated through an angle of about 45 degrees. Uranium nitrate sprinkled on top of the plate holder and then exposed for 18 hours to the sun gave only a faint negative.—*From the Electrical Engineer.*

TIMING DEVELOPMENT. BY W. D. WOODLEY.*

JUDGING by my early experiences in the study of photography, I am led to believe that development may be considered the *pons asinorum* of our interesting art science. I had always been more or less unsuccessful in producing respectable negatives by what is termed tentative development, and the papers by Mr. Alfred Watkins, of Hereford, in the early part of 1894, entitled, "A method and instrument for timing development," showed the question to me in quite a new light.

It is out of my province in this paper to deal with the subject of correct exposure, and I will merely explain in passing that I believe this is considered by Messrs. Hurter & Driffield, to be a period which produces a range of densities having a regular mathematical ratio to each other. Mr. Watkins pointed out that in order to secure a correct range of gradation the time of development was as important as accuracy in exposure, and whilst it must be borne in mind that his method of timing development will not compensate for gross errors in exposure or the use of an unsuitable developer, I shall endeavor to demonstrate to you this evening that within reasonable limits of correct exposure (which may be determined by one of the numerous exposure meters or tables on the market), together with one of the commonly known formulæ for development, it is possible to produce very satisfactory negatives.

The latitude which may be permitted in exposure varies with the make of plate; I have obtained very good results on some plates with as much as twelve times the normal exposure, whilst other plates would not yield a suitable negative with more than eight times the normal exposure.

Having dealt with the question of exposure, I will now turn to the subject of the actual

* A Paper read to the Doncaster Camera Club, by W. D. Woodley.

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development of a plate, and for the purpose of timing, either an ordinary watch or preferably the Eikronometer invented by Mr. Watkins (which is a small clock, and can be more easily seen in the dark room, and which also practically does its own calculating), may be used. The time which elapses between the pouring on of the developer and the first appearance of the high lights of the image is carefully noted, and this time multiplied by a suitable factor, gives the total time for development of the plate. I wish here to draw your particular attention to the multiplying factor, which is a variable one, being governed by the class, and in some cases strength of developer employed, and also upon the density of negative which suits the taste of each individual operator. In the case of pyro and amidol the multiplying factor varies according to the quantity of each of these agents contained in each ounce of mixed developer; with the other reducing agents, the quantity per ounce does not seem to matter. Again, the quantity of bromide is of importance, for if this be increased beyond the normal proportion of say half a grain per ounce, a lower factor must be taken, and this rule holds good for practically all the developing agents, metol excepted.

With regard to the alkali, provided the strength is kept within limits found reasonable in practice, and does not cause the time of appearance to be inconveniently short for observation, the actual quantity per ounce of developer does not seem to be of much importance; ammonia is not suitable, owing to its quickly losing strength by evaporation; carbonate of soda or potash and the caustic alkalies are practically free from this objection, and it will be found more satisfactory to use one of these. When potash is used in conjunction with pyro, it appears to have a tendency to produce density a little quicker than when soda is used, and a somewhat lower factor is desirable.

The quantity of sulphite, and the temperature of developer, if within reasonable limits, may also be ignored.

It is worthy of notice that with most of the developers dilution of the mixed solution does not alter the multiplying factor, but as before stated, pyro and amidol are exceptions, for any dilution of the developer would reduce the proportion of these salts in each ounce of solution, and thereby alter the factor.

I will now give you a list of developers most generally known, with their approximate multiplying factors (taken from Mr. Watkins' book); these times may be modified to suit individual taste, but I have found them work very well.

Pyro Soda.

1 grain per ounce	11	times the time of appearance.
2 " " "	6	" " " " "
3 " " "	5⅓	" " " " "
4 " " "	4½	" " " " "
8 " " "	3¾	" " " " "
Ilford pyro-soda, for dense negatives	5	" " " " "
Ilford pyro-soda for soft negatives	6¼	" " " " "
Hydroquinone (with caustic or carbonate of soda)		31 times.
Eikonogen		9 "
Metol		28 "
Glycin		14 "
Amidol (2 grains per ounce)		18 "
Rodinal		40 "
Velox		12 "
Imperial Pyro-metol		9 "
Metol and Hydroquinone		13 "

It will be seen that those developers which are looked upon more particularly as detail givers, and under the influence of which the image appears more quickly, have higher factors, whilst the density givers have lower figures.

As to practical results, I have here a few negatives which have been developed with several of the reducing agents mentioned in the above table, and although I do not claim that they are by any means perfect examples, still, when I tell you that they have all been timed from the first appearance of the high lights, and never from the first appearance of the image looked at until fixed, I think you will agree with me that the results are very encouraging, and conclusively point to the method being a practical one. My arguments in support of it have frequently been pooh-poohed, but the greatest tribute to its worth is the fact that one of my bitterest opponents, and a strong supporter of the tentative school, has been won over, and now times his development.

I have not tried what results can be obtained with lantern slides, but I intend to experiment in this branch, and should say that it is possible to obtain more uniform results by timing than it would be by judging the density in the ordinary way.

By the kindness of Mr. Watkins I am able to supplement my own view and portrait negatives with some test slides which have been specially prepared to illustrate the arguments in support of his contention, although you will have noticed from the recent developing competition that these arguments do not appear to hold good in the case of a developer containing a very heavy proportion of pyro.

A word or two in regard to exposure meters or tables. I do not agree with those who oppose the use of these aids, as I think that most of them, especially those on the actinometer principle, are of great assistance in judging exposure, and I cannot believe that it is possible to arrive at a correct estimate by the judgment alone. I can safely say that my percentage of failures since I used these aids and timed my development has dwindled down to an insignificant amount compared with what they used to be, and my inferior results must now be attributed to carelessness in manipulation, accidental fog, uncertain hand-camera exposures, etc. You will notice that even the snap-shots which I will pass around have turned out exceedingly well considering that some of them were taken in the height of summer, and others in the middle of October, all about the same time of day with the same stop and same speed of shutter.

In conclusion, I would strongly recommend beginners at any rate to adopt the system and use an exposure table or meter, and I am sure they will be glad they have taken my advice, for not only will they turn out a large percentage of good negatives, but they will not be disheartened by the repeated failures which so often fall to the lot of the novice.

FOUR COLOR *v.* THREE-COLOR PROCESS. BY C. ANGERER.

(C. Angerer & Goschl, Vienna.)

THE pros and cons of the "three-color process" have been long discussed by printers, engravers and photographers, with no little vigor, and the opinions expressed by them and their trade journals are almost as varied as they are numerous. The writer has always regretted the method in question as a merely beautiful theoretical problem, which, for practical reasons, can never find a wholly satisfactory realization.

"And why not?" will be asked by enthusiasts in three-color work.

Well, in the first place, because it is impossible to print the three plates of the fundamental colors one over another with such mathematical exactitude as to give a combination resulting in a sharp and clear picture. In the second place, because it is equally impossible by mixing the three fundamental colors to obtain the clear gray, black or respectively neutral tint which forms not only a considerable portion but the most important part of every picture.

As regards the actual work on the press, a certain amount of fluctuation in the strength of the colors will, especially in the case of large editions, prove practically unavoidable, and for that reason all three-color subjects hitherto exhibited show characteristic backgrounds and shadows changing sometimes to violet, sometimes to green; we never see a vigorous, clear, and sharp black or brown design.

In order to check, in some measure, the disturbing effect caused by the absence of sharpness, the choice of subjects for three-color reproductions favors those which do not necessitate a clear blue or green, as in this case the blue block, which principally produces the sharpness and strength of the picture, may be printed in a dark black-bluish tint; an expedient which will not help to adequately overcome the natural defects of the process.

And as regards the saving in printing, upon which so much stress is laid. If it is intended to print a picture in three colors only—without any aid of black—the letterpress of title, etc, at foot can, of course, only be printed in yellow, red, or blue, and the last is probably chosen. All who object to the by no means pleasing effect thus produced will be compelled to make a four-color subject out of the three-color one, inasmuch as is added the title in black printing-ink. Then the very next step would be to print along with this letterpress a black key-plate, indispensable both for the uniform success of the copies and for the sharpness of the design. This, however, cannot be carried through quite as simply as it is said, as the black impression would in this case—in consequence of the fact that the combination of the three fundamental colors has already been used for the production of the gray and neutral tints—cause the whole picture to exhibit a totally sooty appearance.

The essential point is, consequently, to produce color-blocks which, although photographed directly from the original, exercise a merely suppletory and regulating effect in those portions of the picture which are covered by the design and render, on the other hand, the coloring itself in all its minute details.

By such a process, worked with the best success in our establishment, the supplement facing this article (done from a water-color drawing) has been produced.

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REPRODUCTION BY THE FOUR COLOUR PROCESS.

BLOCKS BY C. ANGERER & GOSCHL, VIENNA.

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WINTER DIFFICULTIES

BY C. H. BOTHAMLEY.

In winter, a professional photographer's work still goes on, though it may show an uncomfortable reduction in quantity, whilst many an amateur looks to the long winter evenings to provide him with time to develop his summer's bag of exposed plates, or make lantern slides, bromide prints, or enlargements. We propose, therefore, to discuss some of the difficulties that are associated with winter work indoors, for the purpose of pointing out some directions in which they may be more or less completely removed.

These difficulties may be broadly grouped under two heads, namely, those connected with manipulations, and those connected with the solutions used.

First of all, there is the general discomfort resulting from the low temperature of the water used for washing, etc., and in this respect what is usually the disadvantage of having to work from a tank or cistern, instead of with a supply of running water from a main, becomes almost an advantage, because, if the cistern is not large, a sufficient quantity of hot water can be added to bring the temperature up to a more comfortable point. Where a supply from a main or from a large cistern is used, the only feasible plan would seem to be to fit up one of Fletcher's simple and not very expensive water heaters, which can be regulated to deliver the water at almost any temperature that is desired. This plan, however, will probably only be adopted by professionals, or, at any rate, by amateurs who do an unusually large quantity of work. In some cases, the simpler, if less efficient, plan of having a gas burner or paraffin stove on which a kettle of water can be heated will meet all requirements fairly well.

Taking now the operations in order, it is well known that temperature has a very important influence on development, in respect both of time required and of density obtained. Only a few days ago we were consulted by a friend who found himself unable to get satisfactory density, even when development was carried on for a tiresome length of time. It was the old story of a cold room and cold solutions, and it cannot be too strongly impressed on inexperienced photographers that if the developing solution is too cold, proper density cannot be obtained with any brand of gelatino-bromide plates. It becomes indispensable to warm the solutions at any rate up to a point not lower than 50 degs. F., whilst at the same time it ought not to exceed 60 degs. F. or, at the very most, 65 degs. F. When the developers are used in dilute solutions, so that no water is added before use, the only plan generally available is to put the bottles into a large bucket containing water at 65 degs., or 70 degs., and leave them there for at least half an hour before beginning operations. Another plan is to make the developer solutions double the ordinary strength, and then, after mixing them, add an equal volume of warmed water. Under these conditions the temperature of the warmed water should be as many degrees above 60 degs., as that of the mixed developing solutions is below 60 degs. When, on the other hand, the developers are kept in strong solutions to which a considerable quantity of water has to be added before use, the best plan is to make up the developer to half its proper bulk with the cold solutions and water, and then fill up with an equal volume of warmed water, following the rule just stated. Our own practice is to make up a quart or half a gallon of the warmed water before beginning work, and to have some hot water not far off (a kettle on a gas or paraffin burner), so that a fresh quantity can be made up, or what is left of the first quantity can be warmed up if necessary. It should be unnecessary to point out that the stove must not be in the developing room. For testing the temperature, an ordinary chemical thermometer with a paper scale is quite sufficient, and can be bought for eighteen-pence.

Of course, where much developing is done constantly, the best plan is to get one of the automatic heaters, devised by Mr. C. E. Hearson specially for this purpose, but it is a somewhat expensive piece of apparatus.

Fixing is also affected by temperature, a considerably longer time being required when the fixing bath is cold. In winter we always use a bath containing 40 parts of hypo in 100 parts of water, which is double the strength that is generally used. When plates contain any notable proportion of silver iodide, fixing with a bath at a temperature much below 50 degs. F., is an extremely slow operation, and with plates of this kind it is almost essential to previously warm the fixing bath up to about 60 degs. F., and this heating may have to be repeated as the bath gets cooled by putting into it plates from the cold wash water.

Another difficulty often met with in winter

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is the liability of the plates to frill. This may come as a surprise to those who imagine that frilling only takes place in warm weather. The actual fact is that frilling is caused by rapid and considerable changes of temperature, whether it be from cold to warm, or from warm to cold. Such a change, of course, takes place when the developer is at a proper temperature for effective working, and the water used for washing is very cold. We have had more cases of frilling during December than we had all through the summer, although during the former period the temperature of the developer was not higher than 55 degs. F., and often not higher than 50 degs. With plates of the present day, frilling in ordinary weathers is very rare. The risk of frilling in cold weather is reduced by not pouring off the developer and flooding the plate suddenly with cold water, but allowing the cold water to run very gradually into the developer, so that the temperature of the contents of the dish, including the plate, is reduced gradually.

The toning of prints is not carried on satisfactorily at any temperature below 60 degs. F., but the warming of the toning bath is a very simple matter.

The fixing of prints is effected by cold weather in the same way as the fixing of negatives. A longer time must be allowed, or a stronger fixing bath must be used than in summer.

A winter difficulty of another order, but not less troublesome, is the deposition of various salts from their solutions, with a consequent alteration in the strength of the latter. The deposited salt can, of course, be seen in a crystalline form at the bottom of the bottle, but the change involves the trouble of redissolving this salt by the aid of heat, if it is desired to work with the solutions at their proper strengths. Fortunately, the solutions used for developing negatives are not liable to alteration in this way, but on the other hand ferrous sulphate and potassium oxalate solutions, which are so largely used for winter work with bromide paper, are certain to deposit an indefinite proportion of the salt in cold weather, especially if the solutions have been saturated at the ordinary temperature. Alum solution behaves in the same manner.

The only way of reducing the trouble is to take care that the solutions are not saturated at the ordinary temperature, but, on the contrary, contain only so much of the dissolved salt as they can retain at such low temperatures as are likely to be met with in winter. The following table shows the quantities of different salts dissolved by 100 parts of water at different temperatures.

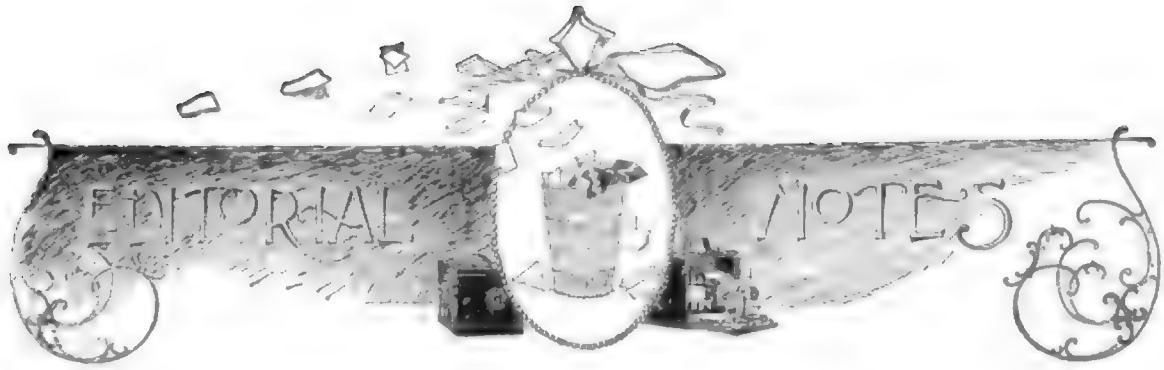
	0°	41°	50°	59°
Sodium carbonate (anhydrous)	7	9½	12½	16½
Sodium carbonate (crystals)..	19	25½	34	44½
Sodium sulphite (crystals)....	28	—	—	—
Hypo	75	—	—	—
Alum	5½	6½	67½	9
Ferrous sulphate (crystals)...	14	22	29½	37½
Mercuric chloride	5½	—	6½	—

It will be seen that sodium carbonate, sodium sulphite, and hypo solutions of the strengths commonly used are not liable to alter in strength even at the freezing point of water. Alum and mercuric chloride solutions should not be stronger than 5 parts in 100 (or 5 per cent.), but this is quite strong enough for all practical purposes. We have not been able to find any data with respect to potassium oxalate, but both it and ferrous sulphate, when used of the ordinary strength, deposit part of their salt in cold weather. Each of these solutions should contain not more than 1 part of the salt in 4 parts of the solution, and during the winter the stock solutions should be kept in a room that does not become colder than an ordinary living room.—*Photography.*



A STUDY BY C. PUYO

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The Photographic Society of Vienna has (according to the *Photographic News*) awarded a medal to Herr Jandourek for the following process of restoring faded prints :—Prepare two solutions. A: Sodium tungstate, 100 parts; distilled water, 1,000 parts; B: Chloride of lime, 1 part; carbonate of lime, 4 parts; chloride of gold and sodium, 4 parts; distilled water, 400 parts. Solution B is prepared in a yellow bottle and left for twenty hours before use; it is then filtered off into another yellow bottle. For use add 2 to 4 grammes of B to 160 c.c. of water. The prints, after being well washed, are placed one by one in the solution for ten minutes, by which time they acquire a rich purple tone. After being well washed, the prints are fixed in a solution made by the addition of 8 grammes of hypo to solution A. They are left therein until the yellowness disappears.

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Messrs. Schering & Glatz call our attention to the fact that Letters Patent of the United States were granted to G. C. F. Hauser, of Erlangen, Germany, Assignor to the Chemische Fabrik auf Actien, vormals E. Schering, of Berlin, Germany, for a composition consisting of gelatine and formaldehyd, combined in such proportion and in such manner that the resulting composition is capable of resisting moisture and heat. They quote from Letters Patent No. 572,295, dated December 1st, 1896, the following claims :—

"1. The herein-described waterproof composition which consists of anhydrous formaldehyd gelatine free from photosensitive ingredients.

"2. The herein-described method of producing a waterproof gelatine composition which consists in subjecting the gelatine free from photosensitive ingredients to the action of a watery solution of formaldehyd, then removing the gelatine composition from the solution and then drying the same."

The composition of formaldehyd and gelatine is also patented in England, Italy, France, Austria, etc.

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They seem to have had things a bit mixed up at the recent exhibition at Berlin. Soon after the opening Mr. Clarence B. Moore, the well-known Philadelphia amateur, received numerous communications regarding some beautiful slides of flower studies on view there. As he had not entered any slides, but only a few pictures, the letters were naturally somewhat of a surprise to him. Then he had a medal awarded to him. He has recently received his pictures back, and included with them are fourteen superb lantern slides, on which the name of Mr. W. A. Fraser, of the Camera Club, of New York, is marked. Now, the question is, was the medal awarded for the prints or for the slides. If for the latter, Mr. Moore is, of course, ready and willing to hand it over to Mr. Fraser. The whole circumstance is certainly a very annoying one, and shows gross carelessness on the part of the exhibition authorities.

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The frontispiece in this issue is a reproduction of a flash-light photograph by Mr. Leo D. Weil, a young man from Chicago, who has recently established himself in New York City as a "non-studio photographer," or "fotographer," as he prefers to call himself. We also reproduce a couple of other studies by this artist. We recently had the pleasure of examining a number of very successful flash-light studies, and must congratulate Mr. Weil on his success in overcoming the chief difficulties which attend this branch of the art. Of the number of flash-light photographs of interiors which we have seen the majority have been spoiled by unsuccessful lighting. Unless the light is distributed evenly over the whole scene the result is harsh and chalky. Mr. Weil's pictures are soft and delicate. While his posing is not always successful, being at times somewhat stiff and unnatural,

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DOLLY AND I BY LEO D. WEIL.

yet his work, taken on the whole, is far in advance of anything of this kind that we have seen, and we predict a successful career for this young photographer. He has undoubtedly a big field to work in, for there are many we imagine who would prefer to be taken in their own home, with natural surroundings, to the trouble and annoyance attendant upon a visit to the photographer's gallery.

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It is a well known fact that printing papers such as "Aristo" or "Empire," which are intended for printing out like albumen paper, can also be used in the same way as bromide paper, that is to say, a short exposure can be given and the image developed with a suitable agent. Very few, however, have met with much success with this method; the results have usually been of an unpleasant color and devoid of brilliancy. Often the whole surface is more or less fogged, the prints having a dirty appearance.

The following directions given by Liesegang in the *Phot. Rundschau*, translated in *Photography* will therefore be of value, especially in these dull days when the immense advantage of a developing printing process over a print-out one needs no demonstration. "Hitherto the great stumbling block has been the use with chloride papers of the developers ordinarily employed for negative work. That the results were necessarily inferior will readily be understood when it is recognized that one of the qualifications for success in the development of chloride prints is an acid or neutral condition of the solutions. An ordinary developer might, by strong additions of potassium bromide, produce passable prints, but perfect success will only follow alkalinity. Another source of error has been the pressing into service of ferrous oxalate and amidol. Now, however admirable these two reagents may be for bromide work, owing to their tendency to blacken the surface of chloride papers they are quite inadmissible for development of printing-out paper. With



Copyrighted 1896. By Leo D. Weil

THE VILLAGE BLACKSMITH BY LEO D WEIL

these two exceptions, all the other developing agents may be employed, as well as such substances as gallic and tannic acids, which are incapable of reducing the image on bromide of silver. Whichever reagent be selected, it should be conjoined with acetate of soda, and, save in the case of gallic or tannic acid, be rendered slightly acid with nitric or other acid. The exact proportion of the constituents of the developer is of little consequence if the strength of the reducing agent be limited to what it would be in negative making, and the acid restricted to a simple avoidance of alkalinity. As regards the other element, it may generally be stated that an increase of acetate of soda gives more harmonious tints. Hydroquinone, strengthened with acetate of soda and citric acid, produces prints that, with simple fixing, finally acquire the warm brown seen in print-out proofs. Pyro, under the same conditions, gives a dirty yellowish brown color, and analogous results are obtained by developing with paramidophenol and pyrocatechin. Gallic acid with acetate of soda gives, when the printing is of ordinary depth, greenish brown tints, and warm browns (which are not, however, so pure as those obtained by hydroquinone) when the printing is carried to a stage which leaves little more than the lights. In practice, the only reagents worthy of consideration are hydroquinone and gallic acid, the first for the beauty of the color it gives, and the second for its artistic effects. The other developers produce tints that are not quite pleasing. It must not be supposed that the colors given by development are the only ones to which we are restricted, although, by judicious printing and gallic acid development, we can ring all the changes from red to brown, olive, and greenish black. When hydroquinone is employed, toning with gold is possible, and the ordinary photographic purples easy of attainment."

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DEUIL BY C. PUYO

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THE QUESTION OF DEVELOPMENT.

By Rev. A. H. Blake, M. A.

The beginner is flooded with instructions as to how to develop, and the number of developers which he is persuader to use would fill a good sized cask if only one dose, sufficient for a half-plate, were made up of each.

Whatever may be the merit of all the various and wonderful productions on the market we are unable to say, in most instances, from experience, but if they do all that their advertisers promise for them they are marvels indeed.

We shall speak here only of two, both old and well-tried friends, and those to which very many who have been flirting with these new comers are again returning.

One piece of advice is often given and seldom followed —get to know one developer and *stick to it*. So we shall explain the action and use the pyro with soda or ammonia, and hope that if the beginner has not yet settled down to a developer he will get this mixed up and use it till he understands it well, and then "he will use no other." The first point about the developer I am to speak about is that we mix it ourselves; therefore we know exactly what the ingredients are, can ascertain their different actions, and mix our developer according to the supposed exposure of our plate, or, failing any knowledge of what exposure has been given, we can mix a tentative developer which will do little harm, and then when masses are out, mix another to suit the state of things which the action of the plate reveals.

Now first of all, what is the object of development? This question we answer in the negative—it is not to produce a pretty or sparkling negative, but a negative which when printed will give the relative tones accurately. We may have a negative of the most brilliant and sparkling character, plain glass shadows *et hoc genus omne*, but for printing we may find a poor, foggy, dirty-looking article which we should incontinently condemn to execution, give the truer print. We do not *advocate* dirty and untidy negatives but only state a fact.

Our moral is, don't make the negative for its own sake, but only as a means to an end, and that end the finished print, which we are to keep in mind all through the different stages from exposure to framing close or with a margin.

Let the beginner just take note of what chemicals it will be requisite to buy, and their probable cost.

For pyro-ammonia development we shall require—

1 oz. Schering's pyro, 1*s*.
1 oz. metabisulphite potash, 3*d*
1 oz. bromide potassium, 3*d*.
1 oz. liquor ammonia, 880, 1*d*.

For pyro-soda developer we should recommend the formula given by Messrs. Wratten and Wainwright for their plates, viz:—

Pyro, 1 oz. Schering's, 1*s*.
A little sulphuric acid, 3*d*.
1 lb. of sulphite soda, 1*s*.
1 lb. carbonate of soda (crystals), 6*d*.

To make up the pyro-ammonia developer we shall require three 10 ounce bottles, which we proceed to fill in the following manner, labelling them:—

No. 1, pyro solution, 10 per cent.
No. 2, bromide, 10 per cent.
No. 3, ammonia, 10 per cent.

No. 1.—Put into this bottle the 1 ounce of metabisulphite and several ounces of water, and shake up until all is dissolved; then pour this mixture into the blue pyro bottle and shake up till dissolved, then pour back into the bottle No. 1 and fill up with water. Distilled water is preferable.

No. 2.—Put the ounce of bromide into this bottle and fill up with water, and when dissolved it is ready for use.

No. 3.—Put the ounce of ammonia into this bottle and fill up with water.

Now as to the pyro-soda developer. For this four bottles will be required, two Winchester quarts (80 ounces) and two 10 ounce bottles.

Label the one Winchester quart—

No. 1, Pyro stock solution,

And the other—

No. 2, Soda stock solution.

In the bottle labelled pyro solution put 6 ounces of sulphite soda and about 20 ounces of water, and shake up till dissolved, add 1 drachm of sulphuric acid, and then pour some of this solution into the bottle of Schering's pyro till it is dissolved, then pour back into the Winchester quart and fill with water.

Into the Winchester quart, labelled "soda solution," put 6 ounces of carbonate of soda, and fill up with water.

We will speak of the use of this latter developer first, as it is the easier.

For ordinary use pour 10 ounces of pyro stock solution into a 10 ounce bottle, labelled pyro solution, and the same quantity of the soda in a 10 ounce bottle, labelled soda solution. These are for immediate use, and for normal exposures should be used in equal quantities without dilution.

This developer will act energetically and quickly, and is fairly under control. If matters seem to be progressing too rapidly, pour the developer into the glass measure and allow development to proceed for a moment or two without anything on the plate, then return the developer to the dish, repeating the process several times.

Should there be known under-exposure increase the quantity of soda in relation to the pyro, and *vice versa* should it be known that the plates have been over-exposed.

With this pyro-soda developer it will be necessary to use the alum bath. As soon as development is complete, wash in several changes of water and place in fixing; after fixing is finished, wash well and place in the alum solution (10 ounces of water added to 1 ounce of saturated solution of alum), and keep the plate moving about for a short time, and then leave till the next plate is ready for the aluming.

If the alum solution be omitted there is a green tinge on the negative which adds very much to the length of time required in printing, while after alum bath there is more clearness and blackness in the negative.

Let it be taken for granted that in certain cases where time is no object and softness is distinctly required, the alum can be omitted with intent to a certain result.

We shall continue to speak of development with the pyro-ammonia solution, and give detailed information on its power and use, at the same time endeavoring to give hints and helps for the beginner on this whole question of the transformation of the exposed plate into

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a negative, for though it will require time and skill to master its difficulties the beginner's course can be smoothed considerably by advice and help at the start.

It may be convenient at this stage to state what are, generally speaking, the most convenient quantities of developer to make up for the different sizes of plates, so as to avoid, on the one hand, splashes from over-fullness, and, on the other, markings on the negative from too much air getting to the plate during development.

Up to half-plate	2 ounces
7½ x 5	3 ounces
Whole-plate	4 ounces
10 x 8	6 ounces
12 x 10	8 ounces
15 x 12	10 ounces

Before large sized plates are flooded with developer it is well to put them to soak in water, for though it is easy with one sweep to send the developer all over a half-plate, it is not so in the case of 15 x 12, unless the film has had its repellent properties removed by soaking in water.

We spoke last time of the composition of the pyro-soda developer, and also gave the formula for the mixture of pyro-ammonia 10 per cent. solutions. We shall now proceed to explain the use of this latter developer and how it may be mixed in different proportions to suit the kind of exposure which we have reason to think that the plate has received.

We have then three 10 ounce bottles—one labelled, No. 1, pyro; one, No. 2, bromide; and the last, No. 3, ammonia.

For plates which have received correct exposure it will suffice to put into our measure 30 minims of No. 1, 15 minims of No. 2, and 20 to 40 minims of No. 3, for *each* ounce of developer we have to mix, and fill up to the required number of ounces with water, so that in the case of a half plate for the development of which 2 ounces should, after a little practice, suffice (use 3 ounces at first), our developer would be—

No. 1	60 minims
No. 2	30 minims
No. 3	40–80 minims

and fill up to 2 ounces with water.

It is better always to begin with about two thirds of the full quantity of No. 3, and add a few minims at a time as required to bring up the image.

Now, as pyro is the density-giver of our developer, and bromide by showing development helps to give contrast, it is clear that when we have subjects which are already strongly contrasted in themselves, and likely, unless we are careful, to give too strong contrasts, we must reduce these constituents.

Again, when we have subjects in themselves weak and washy, we must increase these in order if we desire to do so to give that contrast which the subject is apt to lack.

The following scale of proportions in relation to the subject has been given by one or two of our leading workers, and may be a guide to the beginner in regulating his developer according to the nature of the expected image

For strong subjects, portraits, foregrounds, and those having already much contrast in themselves and not requiring it to be brought out by development, but, if anything, to be reduced, the following is recommended:

No. 1	10–20 minims
No. 2	5–10 "
No. 3	5–80 "

each to 1 ounce with water.

For medium subjects which do not require either much contrasting or much flattening—

No. 1	20–40 minims
No. 2	15–20 "
No. 3	10–160 "

each to 1 ounce with water.

For subjects which, being devoid of much contrast in themselves, require help in development—

No. 1	40–80 minims
No. 2	20–40 "
No. 3	10–320 "

each to 1 ounce with water.

In short, we may sum up these points in a couple of sentences, which should be committed to memory by beginners, that they may have them at their fingers' end in the dark-room, where they cannot be running about to consult note-books and memoranda:

Subjects with strong contrast require very full exposure, reduction of pyro and bromide, and increase of ammonia.

Subjects with weak contrasts require short exposure, increase of pyro and bromide, and decrease of ammonia.

Now, to state in general terms what our object is in the development of our plate

It is certainly not to produce a pretty, bright, and sparkling negative, with everything clean and bright throughout. Some of the most beautiful, tender effects we have ever seen were printed from negatives that the amateur would throw away in disgust.

The chief aim which is set before us in development is to get the proper density in all the different parts of the negative, so that when we come to print we shall not find, for instance, a girl's pinafore showing as a blank white mass, devoid of all detail, when the doorway, the yard, and all the surroundings are fully printed-out for toning. Or, again, in the case of a view which contains heavy foreground material, that we may not find this a mass of impenetrable solarization when the distance has just been brought up to the proper printing density. No, our aim is that the negative shall give us a print with all its parts in due and proper printing relation to one another.

This is called relative density, the density of one part of the negative in relation to the density of another; general density is quite another thing, and may be obtained either by bringing out the detail with a weak developer, and then using a strong one to give density, or the better plan is to so manage development that density is obtained by the time the detail is all out to our satisfaction.

General density should be regulated by the printing process which we intend to use, some processes requiring a thin, delicate negative, and others, which much reduce contrast, a strong and vigorous one.

Judging density is supposed to be one of the beginner's great difficulties, but really it is very simple, provided we maintain *uniform conditions in the dark-room*, using same make of plates and a constant light; daylight is constantly changing, gaslight varies in intensity with the pressure from the main, but a good oil lamp should serve our purpose well, giving a steady, certain light.

Holding our plate up from time to time to our lamp, we shall soon learn what appearance in the case of our

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own plates will give the amount of printing density which we require in our negative.

The difficulty of this will be immediately apparent when we consider that one portion of the plate has probably received a hundred or a thousand times more exposure than it ought to have done.

Take the case of a pool of water with sunlight glinting on it, and as a foreground a piece of heavy dark foliage and bank in shade. Two seconds might not be an excessive exposure for the latter, while 1-100th second might be the proper exposure for the other. How difficult and almost impossible the task of getting these two in proper printing relation to one another, and very skillful development, and possible the local application of bromide with a camel's hair brush may be necessary in order to achieve our aim; for it is far better, if possible, to get what we aim at by development than to have recourse to all kinds of printing dodges, afterward, to force our unwilling negative to give us what we have determined at all costs to get.

The chief thing to notice in development is that the portions of the image appear on the plate same as they do in the camera or to the naked eye, so that if one part is much brighter than another then that part should come up first, *e.g.*, the sky in a landscape. A certain time should elapse before the other parts appear in order; tones not differing much should come up about the same time. The shadows, if they are very dark, should come up at the end of the development.

If we bear these thoughts in mind in the dark-room, and notice the gradual building up of the image, from the graying of the sky through the appearance of half-tones to the final stage of detail in the shadows, we shall certainly think it one of the prettiest things in chemistry, and wish we could have it out in the light to examine it more at our leisure and by a better light.

Near subjects coming up bright and clear is a good sign, but distance coming up clear is supposed, on the authority of some of the knowing, to be a sure sign of over-exposure.

The more the high lights are held back the more chance there is for the shadows to gain detail.

The high lights want careful watching to avoid over-density, and we may even have to apply bromide to keep them back. In this way many save their skies, but we are hardly persuaded of the advantage of such a proceeding when double printing is so easy.

Let us repeat again, the great aim in developing is to secure *such a negative that the different parts of the picture will print together in their proper tonal relations*.

Development is a subject upon which chapters and books could be written and it is hardly to be expected that we in our unscientific way can do more than give a few working hints to beginners. Still, there remain even in this manner of treatment a few hints of a general character which we should like to give to the beginner on this subject.

There are those who think that a *great deal* of difference can be got by variations in the developer, but it is to be remembered that no chemicals can bring out what light has not impressed upon the plate, therefore it is far better, if mistakes are to be made, to err on the side of over rather on that of under exposure. Modern dry plates have a wonderful range of possibility, and allow much latitude, so that although correct exposure is of course best, much over-exposure will not ruin the plate.

There is not very much to be done in development in the way of altering result, except to brighten or flatten the resulting negative.

If the subject be in its nature without much range of tone, make the negative dense; if it be inclined to over-contrast, keep the negative a thin one.

For example, to take one of the most likely subjects for a hard negative, the proverbial white house and dark foliage, get the negative in this case thin, and remove from the developer before it has reached what you are accustomed to regard as the average of density.

In mixing the developer, turn to your note-book, consider the conditions there entered: The nature of the subject, having a wide range of light and shade or otherwise, violent contrasts; time of day, mid-day, when all things are flat against one another, or an against-the-light effect with strong contrasts. Remember all you desired to get—a brilliant view, or a soft, gentle, quiet effect—and mix your developer accordingly.

Be most careful to guard against light fog. If you are to exercise full control over your negative, mind that slides, dark-room, etc., are all quite "safe"

But in spite of this we have known times when to actually open the dark-room lamp and expose the whole of the developing plate to the action of the naked light for a few seconds has the most salutary effect in softening a tendency to hardness in a negative, and with use of great judgment this course may, under certain conditions, be recommended to the beginner, provided that he does it deliberately for a set purpose and not accidentally through carelessness when not wishing to do so.

It may be useful here to append the various methods to increase contrast generally given by that master of development, Mr. C. W. Gamble:

A.—No. 1 1 grains
No. 2 3 grains
No. 3 6 grains

B.—Use hydroquinone with a restrainer.

C.—Immerse the plate in a half per cent. solution of bichromate of potash for a few minutes, rinse the plate, and then develop.

D.—Get the negative as dense as you can, reduce, and then intensify.

These are a few mechanical helps to development which ought not to be lost sight of and for want of which many a good negative has been lost.

It may seem a small thing, but it is often really important to have a cover for the developing dish.

Sometimes it is required to give a brilliant negative free from fog, or it may be that the case is one of long-continued development to get up a very rapid snap-shot; we find that a cover, either of a lid of a box, or a black cover which can be bought in the market on purpose, effectively shields the plate from the light when not being examined and prevents fogging the plate unintentionally, for remember, though we advise the beginner sometimes to fog his plate with *malice prepense*, we never advise him to do so by accident and without his own control.

Then again a very simple thing often neglected, to our loss, is the rocking of the plate. Most elaborate arrangements, costing pounds, can be got, no doubt, to do this work for us, but we prefer our fingers and our

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stalwart arms, and a 15 by 12 in a porcelain dish does require a stalwart arm. Only let the beginner remember how to rock just sufficient to send a wave of the liquid along the plate, but not sufficient to expose any part of the developing plate to the action of air in doing it.

A very simple device, but no end useful and saving much mess, is a lifter, a piece of metal so bent as to lie on the bed of the tray, pass along the side and over the edge, so that a pressure on, the forefinger will lift the plate, without our fishing about for it in the uncertain light of the dark-room, and often tearing off the film with our nail in so doing, moreover keeping our fingers far freer from pyro stains than they ever were in the days when finger and thumb were kept constantly groping in the developing solution.

When the development is complete let the usual instructions be faithfully followed to rinse the plate well with water before placing in the fixing bath. There is a horrible and peculiar snail-like marking which fixes on some plates during ammonia development, and if the plate be immersed in the hypo with the markings on it they will adhere and become fixtures, but a good wash, and, if necessary, a little gentle rubbing with cotton wool will remove them before it is too late.

In conclusion, we heartily wish the beginner success in his dark-room work, feeling that if he takes pains to master matters there and really understands what it is he is trying to get—not pretty negatives, but well-graded, good printing ones—he will save himself an infinity of trouble in the afterwork.

It often used to puzzle us why in a certain school of photography in the metropolis they always began their instruction with a printing class—it seemed like putting the cart before the horse—until we realized that one must know what sort of negative one wants to get to give a good print before one can set to work to get it, and that it is really the wisest course to teach the beginner "*what*" negatives yield "*what*" prints, before setting him to work to make them.

Moreover, a thorough knowledge of printing processes is most useful in the dark-room, as supposing we say to ourselves, "This subject which I am now about to develop will probably have to be printed on C C platinotype, or, on the other hand, in solio," we shall make a thin, delicate negative, full of detail, or otherwise, as the case may require.

There is another question which may be asked by the beginner, "What alteration will it make in the resulting negative if I have a very dilute or a very strong developer?" The difference is chiefly one of time. The stronger developer will act more quickly and give a final result with perhaps greater density in the long run than the weak one. Here, again, is a power in the hands of the operator who desires to control his final results and work intelligently in the dark-room to given ends, and not allow the plate to give him, in reply to his flooding with a certain mixture called a developer, just what result it likes.—*The British Journal of Photography.*

Duty on Cinematographs.—In Switzerland the duty on Cinematographs and similar instruments for displaying chronophotographs has been fixed at sixteen francs per 100 kilogrammes.

THE BABY AND THE CAMERA.

BY C. S. M.

When first the Amateur begins
 His graphic art to ply,
He'll be confronted for his sins
 With babies pink and shy,

Accompanied by their mothers, who,
 With pardonable zeal,
To photograph their "chicks," to you
 Will artfully appeal.

'Tis best to turn unheeding ears
 To such maternal wiles,
Or you must "take" them robed in tears
 And print them wreathed in smiles.

So small! and yet demanding much
 (Should you unwisely yield);
An iron nerve, a master touch,
 The camera to wield.

Drop-shutter, and of plates a pile,
 And eke a wealth of tact,
To get the innocents to smile
 And catch them in the act.

Then failure! 'tis the very deuce,
 And drives the parent wild,
Should you unwittingly produce
 A double-headed child.

The beauty in the baby's face
 One eye alone can see—
Its mother's—there is not a trace
 Revealed to you or me.

None but a Raphael ever could,
 Since mediæval time,
Transform our fretful babyhood
 To something more sublime.

So, amateurs, be suave yet bold,
 Beseeching friends appease,
Quote "painting lillies," "gilding gold."
 But take no babies, *please*.

—*Journal Photo. Soc., Madras.*



ON BOARD A DUTCH MAN-OF-WAR BY A. PIERRE

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NOTES.

The January issue of this magazine is nearly sold out.

Photography in Natural Colors Again.—Mr. Bennetto, a photographer of Newquay, England, claims to have discovered a process of producing naturally colored photographs. He has disposed of his process to a syndicate for a large sum of money.

Dark Rooms free.—A young gentleman away out in the Western "Never, Never" recently wrote to a Melbourne firm of photographic dealers, enclosing a small order, and wound up with: "I see by your advertisement that you supply 'dark rooms for amateurs free of charge.' Please send me one with goods ordered." Fact!

This is the way the new Lieutenant-Governor of New York puts it: "Let us expose the lenses of the mind for a moment to receive upon the film of memory an impression of what the album of history contains." The first thing that young man knows he will be called upon to preside over the State Photographers' Association.—Ex.

Could See Gold.—Physician of the new school after turning X-Rays on patient: "Your case is a somewhat complicated one. There is a slight trouble with your left lung, and I observe enlargement of the liver and a fatty degeneration of the heart. Kindly hand me those two sovereigns in your right hand trousers pocket and I will prescribe for you."—*Fun*.

Roentgen Rays in Palæontology.——M. Lemoine, of Rheims, has exhibited negative photographs, obtained by Roentgen rays, of fossils embedded in the chalk strata of Rheims. The Roentgen rays pass imperfectly through phosphates; the bones of the fossils are clearly indicated in all their details. M. Lemoine has thus photographed a series of birds, reptiles, and mammals. This method seems an improvement on the use of sections.

X-Rays in the Royal Kitchen.—We learn, says the *Optician*, that the fluorescent screen and X-rays have been introduced into service in the Royal kitchen with much benefit. They are instant and infallible detectives of stray fish bones, plum stones, and what not, improperly situated in the prepared articles of Royal food. An X-ray glance at each "dangerous" dish, ere it leaves the kitchen, lifts a great weight of responsibility from the cook's mind.

Ink for Writing on Glass.—A new ink that will write on glass, and can take the place of paper labels on bottles, etc., as it is indelible. It is made by dissolving 20 grams of brown lacquer (not heated) in 150 cc. of commercial alcohol, and mixing this, a drop at a time, with a solution of 35 grams of borax dissolved in 250 cc. of distilled water. It can then be colored as preferred; 1 gram of methylene violet, for instance, will produce a handsome ink.—*Nouveaux Remedes*.

Typical Americans.—The Idler: "Whose picture is this?"

The Photographer: "It is a composite. I call it 'The Typical American Girl.'"

"It is awfully pretty. I wonder if I know any of them."

"I'll give you their names, and you can see. They are Maggie Groarty, Sophie Pixczinski, Wilhelmina Schwartz, Rebecca Einstein, and Christine Olsen.—*Indianapolis Journal*.

Free Drinks to Sitters.—It is reported in the press that some photographers resort to an innocent (?) practice of supplying nervous clients with an inspiriting cordial or a stiff glass of brandy—preparatory to the ordeal of the studio pose It is added that the police are interested investigators of the extent to which this singular practice is pursued. It is to be remarked as being very questionable (as a fine point of law) to what extent any business man (other than a licensed victualler) is acting within his rights when offering, to a customer, a glass of wine.

A Phantom Picture.—Put a sheet of ground glass behind a portrait negative and place it against a window strongly lighted. Darken all the panes except the one against which the negative is placed, then look steadily at one point of the negative for about half a minute. On then directing the eyes towards the dimly illuminated ceiling of the room a beautiful positive of a rich sepia will be seen. By this simple method a likeness can be recognized by those who are not practised in examining negatives.—*Photographic News*.

An Odor Test for Water.—Curtman's *Chemical Analysis* has the following to say on this subject: "Good water should be inodorous, or, at least, void of any odor in the least offensive. Water of even feeble odor, when first taken from the well, may, by standing, yield a much more intense and often disgusting odor. This is best detected by filling a large bottle half full of water, corking it and shaking it vigorously, and, on removing the stopper and applying the nose to the mouth of the bottle, the odor may be distinctly perceived.

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No Monopoly in Films.—Judge Townsend, of the United States Circuit Court, has handed down an important decision against the Eastman Kodak Company, of Rochester.

They alleged an infringement on patents owned by them on machines and a process for making photographic films. A victory for them would have established a complete monoply of the manufacture of films used in snap-shot cameras

Judge Townsend orders that a decree be entered dismissing the complaint, and vigorously scored the attorneys for clogging the judicial machinery with a superfluity of testimony and exhibits.

Photographs of Steam.—A number of photographs of a vertical steam-jet have been obtained by Mr. A. Forest Palmer, with the aid of sunlight. The invisible portion has the general shape of the inner mantle of a Bunsen flame, and its outline depends upon the pressure of the jet and the velocity with which the condensation travels towards the nozzle. Mr Palmer finds that the separation surface of the invisible portion is sharply marked, and that it oscillates up and down The demarcation is probably due to the fact that the instantaneous heat of condensation is able to superheat the supersaturated steam as it arrives at the surfaoe.—*The Optician.*

Slow Development.—Hand camera men, especially those who object to trouble, should try the following system of development, advocated by H. Fourtier, in the *Progrès Photographique.*

Make a solution as follows:—

Water	1000 parts
Hydrochinon	75 "
Ferrocyanide of potassium	10 "
Borax	5 "
Carbonate of soda	75 "
Carbonate of potash	25 "

Then place, in a grooved fixing bath, 50 cc. of this solution, and a litre of water.

This bath is said to work very slowly, and cleanly, so that twelve negatives can be placed in the grooves, and left for several hours until proper density is attained.

Physical Science a Hundred Years Ago.—If we try to sum up the position in 1796, we find that, though some advance had been made in theoretical mechanics and dynamics, there was very little knowledge about heat, light, electricity, or chemistry. It was known, for example, that, if sulphur, glass, or sealing-wax was rubbed, or bits of zinc or copper were immersed in salt and water, sparks and shocks could be got out of the arrangement; but up to 1880 the phenomena of electrolysis were wholly unknown, and not till even later were the magnetic properties of the current discovered. The "corpuscular" theory of light held its own till the early days of the nineteenth century, and "caloric" was still regarded as a sort of matter which could enter into chemical combinations, and could be squeezed out of bodies like water from a sponge. Chemistry, at the same time, was only just emerging from the disorder attending the dying struggles of the phlogistic doctrine, and even the Lavoisierian system, which had taken its place, was disfigured by many errors, which could only be rectified by a long series of experiments more exact than anything which had ever before been possible.—"W. A. T.," in *Nature.*

A New Kind of Pyroxyline.—We have for a long time had before us blasting gelatine, a kind of gun-cotton, partly dissolved in nitro-glycerine, but Professor Mendeleef has now described a fresh form In a general way, soluble photographic "gun-cotton" has been described as di-nitro cellulose, and the more soluble explosive variety as tri-nitro-cellulose. The Russian professor's variety seems to be a further modification; but it is rather difficult to understood the brief abstract given of the new agent in a scientific contemporary. It states that the pyro-collodion discovered by Professor Mendeleef is a new form of nitro-cellulose, midway between ordinary gun-cotton, which contains about thirteen per cent. of nitrogen and collodion, containing about eleven and a half per cent." We presume by collodion is meant gun-cotton for making collodion. The new substance, however, whatever its possibilities, is not intended for the innocent photographic plate, but for the deadly purposes of warfare. It, nevertheless, so far resembles our photographic preparation of gun-cotton, that it is made in strips or ribbons.—*The British Journal of Photography.*

Platinum.—The following paragraph appeared in the *British Journal of Photography*, some months ago:—

"*New Source of Platinum.*—The precarious nature of the supply of platinum was well shown a year or two ago, when a small combination was able to "bull" the price of this metal, till from a sum below 30s. an ounce it rose by leaps and bounds almost to the value of gold. It will therefore be good news to photographers that a new source of supply has been discovered of such large area that it may fairly be expected to bring down the price to a level never before reached. We read that in New South Wales a bed of platiniferous lead over a mile long has been discovered. It has been known for some time past that the metal was to be found, but it had not been properly worked. It is stated that the platinum is to be present to the large extent of 75 per cent."

Since this appeared many other photographic and scientific journals have published similar information, and their writings have been recently copied by some intercolonial journals. From personal inquiries made at the Department of Mines of New South Wales, Sydney, we are in a position to state that no such extensive find of platinum has been made in the Colony, and that at the present time the value of this metal is nearly equal to gold.—*Australian Photographic Journal.*

Big Photographs Used as Wall-Paper.—A fashionable photographer of Regent-street has just communicated to us some really astounding facts concerning the growth of his profession. It seems that the latest development of taste in house decorating is the substitution of immense photographs for the ordinary ornamental frieze.

This extraordinary fashion had its origin in a rather remarkable circumstance. One evening a large party of ladies and gentlemen, bound for a fancy dress ball, alighted at the establishment of our informant in Regent Street, for the purpose of being photographed in costume. They arranged themselves in a more or less chaotic group, so that the photographer, who chances to be a painter by profession, was in despair, and ultimately asked his troublesome clients to march through the

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room, and perform the graceful movements of the minuet.

To photograph as many as sixteen people so engaged may sound impossible, and no doubt it would be so to the ordinary photographer. The great man in Regent Street, however, has discovered and patented a process whereby not only is the electric light applied to the purposes of photography, but all the rays are converged upon the sitter.

Bringing his process to bear on the occasion alluded to, the artist succeeded in producing an admirable photograph of the whole party; it measured 3 feet in depth, and no less than 16 feet in length. No sooner were copies of it reproduced than they were utilized forthwith as friezes for fashionable drawing-rooms; and in this way started a very unique mode.

At the present time photographic wall-papers have become quite an aristocratic craze; and it may perhaps be necessary to mention that our informant's clients are chiefly drawn from the very highest circles of society—*Tit-Bits*.

Clouds in Enlargements.—In the *Journal* of the Camera Club, Mr. Henry Everett gives the following instruction for inserting clouds in bromide enlargements: "My plan is this: first expose for the foreground, protecting the sky, if necessary, by shielding the paper with a piece of card cut roughly to the shape of any trees, etc., projecting into it, then proceed to develop, and, when the image has nearly attained the requisite density, pour off the developer and flood the paper with the usual acid clearing bath if using ferrous oxalate, or wash for a few minutes under the tap if metol is used. Next put the cloud negative in the lantern, and adjust the print on the easel to receive the sky selected; this can be done with ease and certainty with the yellow cap on the lens as the foreground is already visible and the exact position of the clouds can be readily determined. Then expose, shielding the lower portion of the paper with a card, and develop, and by the time the sky is sufficiently indicated the landscape will have attained proper density, and, after clearing or washing, the print may be fixed. The partial development of the foreground appears to cause a decrease in the sensitiveness of the bromide paper, and the exposure for the clouds must therefore be longer than would ordinarily be the case; the correct time may be ascertained by making a test exposure on a small piece of paper which has been placed for a few minutes in the developer and afterward washed, thus bringing it to approximately the same condition as that used for the print. I see no reason, either, why the exposure and development of the sky should not proceed simultaneously, the developer being brushed or sponged over the paper while affixed to the easel; I have not tried this method, but the first mentioned plan has for some years worked satisfactorily in my hands."

Humor of the X-Rays.—Mr. B. Hunter, a medical gentleman, who recently took charge of the X-ray exhibit at a large bazaar, relates the following amusing tales in the *Lancet:*

An elderly gentlemen of prosperous appearance, after examining the collection of cathograms and absorbing a brief *resumé* of X-rayism, objected that the show was not "up-to-date," as he had "read somewhere in a newspaper that now you can see the liver palpitating and the heart circulating."

Two elderly ladies entered the small room and, solemnly seating themselves, requested me to close and fasten the door. Upon my complying, they said they wished "to see each other's bones," but I was "not to expose them below the waist-line," each wishing to view the apparently dismantled osseous structure of her friend first!

A young and anxious mother asked me to see if her little boy had really swallowed a threepenny-bit, as he was uncertain himself. She had read in the papers that a great doctor, Sir Something Blister, in a speech at a meeting in Liverpool a little while ago, said that a halfpenny had been seen in a boy's "sarcophagus!"

A young girl, of the domestic servant class, taking advantage of her opportunity, asked me in confidence if I would "look through her young man unbeknown to him while he looked at the pictures to see if he was quite healthy in his internals."

When showing a photograph of the invisible spectrum and mentioning the fact that the mystic X-rays, owing to their enormous vibration frequently should take their position far above the ultra-violet, whereas in reality they have a place in the prismatic spectrum as if infra-infra red, one dignified dame remarked, "I don't wonder they call them *infra dig.* rays when they penetrate even one's most intimately protective apparel."

A Camera Club for San Jose.—At San Jose, California, a meeting of amateurs was called for the 17th of last November to meet in the law offices of C. E. Goodsell for the purpose of organizing a club.

The attendance was much larger than was expected, and Constitution and By-Laws, similar to those of the California Camera Club, were adopted. A committee was appointed to secure club rooms, and the meeting adjourned for one week at which time officers were elected for 1897, as follows:

> Geo. C. Meeker, Pres.; M. R. Gibson, 1st Vice-Pres.; A. Schoenheit, 2d Vice-Pres.; James Gally, Secretary; C. E. Goodsell, Corresponding Secretary, address, Bank of San Jose Building; R. E. Collins, Jr., Treas.; C. E. Bried, Librarian.

The membership of the club is now about seventy-five and is still increasing. Monthly meetings are to be held on the first Tuesday of each month, and at each meeting there will be arranged lectures or exhibitions of some kind.

A fine suite of rooms has been fitted up in the Safe Deposit Block, in which the light is usually good. The dark rooms and printing rooms are superior to any in San Jose, and the reading-room will be provided with all the leading photographic periodicals.

Last Tuesday evening, January 5th, the first meeting was held in the new rooms and brought out about fifty members who made the opening meeting an enthusiastic one. After the routine of business was transacted, the Lantern and Slide Committee took charge and conducted a highly entertaining exhibition. About seventy-five views were thrown upon the screen.

The slides embraced scenes in and about San Jose and throughout the state generally, that had been made by various members of the club. Questions and friendly criticisms brought out much valuable information and

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made the affair a source of profit as well as a delightful entertainment.

Preparations are being made for a Public Print exhibit on April 6th, the advertising posters for which will be selected by competitive exhibits in the club rooms.

Interior work in competition was also planned for the purpose of showing the quality of pictures that could be taken in the club rooms.

The Inventor of the Cinematograph.—It has often been said that there is nothing new under the sun, and some photographers are rather prone to point out that somebody has done something years before somebody else, and now Mr. J. Sachers, of New York, throws a little light on the early history of chronophotography. Titus Lucretius Carus, in his work *De Rerum Natura*, book IV. verse 766, which was published during his life (99–05 B.C.), has the following passage :—

"Quod superest, non est mirum simulacra moveri
Brachiaque in numerum jactare et cetera membra ;
Quippe ubi prima perit alioque est altera nata
Inde statu, prior hic gestum mutasse videtur .
Scilicet, id fieri celeri ratione putandumst."

which may be freely translated by—

"Do not thou, moreover, wonder that the images appear to move,
And appear in one order and time their legs and arms to use ;
For one disappears, and instead of it appears another
Arranged in another way, and now appears each gesture to alter,
For you must understand that this takes place in the quickest time."

Whether we agree with Mr. Sachers or not, the idea of series movements is here presented. In the *Journal of the Royal Institution*, vol. i. p. 205, appears a statement of Faraday's which shows that he recognized the principle clearly, and from this, probably, Stampfer's stroboscope, and Plateau's phenakistoscope were taken, this latter being described in his work, *Dissertation sur quelques Proprietés des Impressions Produites par la Lumière*, published in 1829. In 1845 Uchatius made an instrument which showed moving images to a large number of people at once, and perfected this in 1853. In his instrument the series of images were painted on a transparent support, and were arranged in apertures of a circular wooden disc. Behind one of them was a lamp and condenser, and then, between the transparency and the screen, a projecting objective was placed. A second screen, with apertures in it, was attached to the same axle as the transparency screen, and the whole was enclosed in a box, with only the handle and objective outside. An American patent, (No. 93,594) was taken out on August 10, 1869, for a revolving perforated screen, in connection with an arrangement to give an intermittent movement to the image plate.—*British Journal of Photography*.

A Yarn from "The Kicker."—One day last week, when the car of a travelling photographer reached this town and went into camp on a vacant lot in Apache Avenue, we called on the stranger and asked him if he knew the risk he was running. He replied that he had been all over the West, and was old enough to take care of himself. We attempted to give him some fatherly advice, but he wouldn't have it, and we turned away in sorrow. His first customer was old Pete Johnson. Pete has a mouth on him like an alligator, and it is his tender point. He has killed two men and wounded two others for laughing about it. When we saw him enter the car we knew that the photographer would take his mouth as a whole, instead of covering up half of it with a towel, and that if it showed in the picture shooting would be sure to follow.

Wednesday afternoon Pete called for his pictures, calculating to send one to his mother in Connecticut. He didn't look at 'em till he got into the alley behind *The Kicker* office. Then he opened the package, and as we happened to look out of the back window we saw him jump a foot high. There was some face where the face ought to be, but not much. It was most all mouth. It was a mouth which had no beginning or end—a sort of railroad tunnel, as it were. Pete didn't do anything just then but turn pale and hold his head down, but we knew his vengeance was only delayed. When the sun went down in a blaze of glory and night enwrapped the earth, and the silvery stars came out one by one to do their twinkling act, the town was suddenly aroused by the rattle of small arms. Old Pete Johnson had gathered his crowd, and that crowd had quietly surrounded the photograph car and opened fire. Three wild yells from the photographer followed the first volley. Then all was silent—all except the steady pop ! pop ! pop ! of the guns in the hands of men who had work cut out for them. An object, which might have been the photographer, was seen flying across the vacant lots towards the sand plains, but its flight was so rapid and erratic that not a bullet took effect. When the car had been shot to pieces some one lighted a fire under it, and in the course of half an hour nothing but a heap of ashes was left to mark the spot. No one knows what became of the man who came here with such confidence in himself to cater to a people whom he knew nothing about. We gave him due warning, and our conscience is clear. He is the fourth man who has made the same mistake within the past two years, and if the next comer wants to become a fixture he will get right down on the ground and seek to post himself in advance. We are not a purty crowd in this town, but we don't want our homeliness transferred to a card for outsiders to chuckle over.—*Detroit Free Press*.

Copying Maps.—W. Cronenberg, in the *Photographisches Wochenblatt*, describes his method of reproducing maps and similar subjects, in which it is necessary to render the finest detail correctly. A wet-collodion negative is made upon plate glass, and, after thorough washing, coated with bichromated gelatine, and dried at a moderate heat. The negative is laid face downwards upon a black cloth, and exposed to light from one to three hours, according to density. The plate is then washed to free it from bichromate, hardened in an alum bath, again washed, and allowed to dry spontaneously. It is then etched with a solution of glycerine, and a perfect print is taken from it in transfer ink upon transfer paper. The print is transferred to stone, and reproduced by lithography. The transfer may be omitted if collotype prints are preferred.—*British Journal of Photography*.

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TRADE NOTES.

The Obrig Camera Co. is selling a good "blue paper."

The Perfecto Paper Co. is manufacturing a fine, reliable paper. We recommend giving this a trial.

Willis & Clements have placed on the market a platinum intensifier which, in our opinion, beats anything yet known. It is really worth trying. Intensifying with it is really a pleasure.

Mr. Geo. H. Kahn has sold out his interest in the firm of Hirsch & Kahn, No. 333 Kearney St., San Francisco, Cal., and will open a new store at No. 201 Kearney St., in the same city.

L. Gaumont & Co., of 57 Rue Saint-Roch, Paris, is advertising M. Demeny's apparatus for projecting moving pictures on the screen. If you are interested in this drop a line and they will send you full particulars. We understand the apparatus is having an immense sale in France and other European countries.

The Sarony Publishing Company, 11 East Sixteenth Street, New York, is a new concern which has been organized to publish the photographs of celebrities hitherto issued by Napoleon Sarony, the well-known New York photographer. The company is composed of W. A. Cooper and Francis Le Baron.

The Ferrotyper's Guide. By an Active Ferrotyper. New York: The Scovill & Adams Co. Price 75 cents.

The purpose of this work is to give plain and precise directions for the production of ferrotypes, and this purpose is well carried out. He who wishes to thoroughly learn this department of photography will find in this manual the best of teachers. The fact that it has run through seventeen editions speaks its worth, and is the best testimonial as to its practical value.

A new brand of Blotting Paper, absolutely free of all chemical impurities, containing no wood pulp or clay, being made entirely from cotton, has been introduced. It is called the "World" Special Photo-Finish Blotting Paper, and contains 500 sheets to the ream, and weighs 120 lbs. We recommend the 120 lb. weight, as it makes a more substantial blotter, which lasts longer than the lighter sheets. If your dealer does not happen to have this paper as yet, you can obtain it by sending to the Scovill & Adams Co., of New York, who are the trade agents for the manufacturers. There are cheaper grades of blotters on the market, but none that are better. It pays to get the best.

Grand Central Station, New York.—Entering or leaving New York by the New York Central, the traveler will appreciate the convenience of Grand Central Station, Fourth Avenue and 42d Street, which is in the very centre of the hotel, residence and theatre district, and the point from which all principal lines of elvated and surface cars radiate. The new York Central is the only Trunk Line whose trains enter the city of New York.

"Four-Track Series," Etchings.—Eight beautiful etchings, representing scenery along the line of the New York Central, printed from steel plates on plate paper, 24 x 32 inches, are offered for sale at the office of George H. Daniels, General Passenger Agent, Grand Central Station, New York, at 50 cents each. Art lovers will appreciate this opportunity to secure at nominal cost pictures of high artistic merit, devoid of any objectionable advertising feature and suitable to hang on the wall of any room.

The Luxury of Travel.—"The man who has never been west over the picturesque New York Central has a sensation in store for him that he cannot afford to forego. Nature has done almost as much for him in what he sees, as mechanical skill has done in placing him in a magnificent hotel on wheels, and whirling him toward his destination on the very wings of the wind."—*Hardware.*

Messrs. Hirsch & Kaiser, of 333 Kearney Street, San Francisco, Cal., desire us to make known the change in the name of their firm, formerly Messrs. Hirsch & Kahn. Mr L. M. Kaiser succeeds to the interest of Mr. Geo. H. Kahn. They will remove about March 1st to new quarters at No. 7 Kearney Street.

NOTES ABOUT PHOTOGRAPHERS.

E. W. Newcomb is now editor of the *Photo American.*

W. A. Fraser has succeeded in obtaining some very fine photographs of New York City taken at night.

F. E. Ives is still in England, giving lectures on his krömsköp and method of projecting colored images onto a screen.

R. Child Bayley, the able Assistant-Secretary of The Royal Photographic Society, advocates the establishment of a Photographic Museum.

M. Gaston Tissandier, who for the last quarter of a century has presided over the destinies of our esteemed contemporary *La Nature,* has just retired from the editorship, and M. Henri de Paville has succeeded him.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF JANUARY, 1897.

(Furnished For The Photographic Times by William S. Hodges, Patent Lawyer, Washington, D. C.)

No 574,435. Photographic Shutter. Robert Kroedel, Rochester, N. Y., assignor to Eastman Kodak Company, same place.

A motor device is arranged to actuate a vibratory shutter in opposite directions, a catch being provided for retaining the shutter closed. This catch is actuated by a release member to release the shutter, but is moveably independent thereof. Closing devices actuated by the release member regulate the closing of the shutter, suitably adjusting devices being arranged to act upon the controlling devices to set them and vary their operation upon the shutter.

No. 574,756. Photographic Shutter. Daniel P. O'Leary and Samuel B. Kull, New York, N. Y.

A camera shutter is formed of two plates or slides having openings normally out of coincidence, means being provided for moving these plates in one direction. A dog is arranged to engage one of the plates and hold the same when moved, the other plate being retracted by suitable means, the openings being arranged to be brought into coincidence by the movement of the latter plate, and a releasing device is carried by said latter plate and arranged when the same is retracted to engage the dog and move it out of engagement with the other plate.

No. 574,851. Kinetographic Camera. Marie J. H. Joly, Paris, France.

This is a chronophotographic or shifting picture apparatus in which a picture-bearing film is employed, a feed-roller being arranged to act on the film to form a loop or fold there in advance of the dark chamber and rotated by a continuous movement to unwind the film. A second feed-roller is arranged to act on the film after it leaves the dark chamber, the latter roller being mounted on a moveable support. Means are provided for turning said roller on its axis and for oscillating its support, thereby intermittently advancing the film through the dark chamber.

No. 574,879. Photographic Plate Dipper. H. L. Chenery, Deering, Me.

A plate-holder is formed of a rectangular frame provided with shoulders on its sides and springs attached thereto, and provided with notches in the end for the reception for the plate. An offset is formed in top of the frame, and means are provided for holding the frame as desired.

No. 575,208. Photographic Camera. F. A. Brownell, Rochester, N. Y., assignor to the Eastman Kodak Company, same place.

A camera is provided with devices for holding film near the forward portion and film passages in the side for the film. A movable frame is arranged at the rear of the exposing chamber forming a guide for the film. A door is formed in the camera casing adjacent the movable frame and an automatic light excluding flap is arranged in one of the film passages.

No. 575,431. Panoramic Camera. E. P. Schoenfelder and E. Kehle, Newark, N. J.

A cylindrical film holder is surrounded by a cylindrical casing which is mounted on a suitable support and provided with a vertically-arranged slot. A lens-carrying funnel surrounds said slot and projecting horizontally from the casing, a shutter being carried by said funnel. Means are provided for revolving the casing.

No. 275,761. Means for Exhibiting Consecutive Pictures. H. W. Short, London, England.

This is a strip or band for book-form kinetoscopes, one edge of which carries views, pictures, or representations, and the other edge a row of perforations, the pictures and perforations being in exact alignment, and the perforations having the same relation to the different pictures for the purpose of positioning the latter.

No. 275,814. Die for Manufacturing Cards for Photographic Mounts. P. J. Stuparich, San Francisco, Cal.

This invention comprises a die for the production of photographic card mounts and art panels, and consists of a card or base having an independent surface of roughened material secured thereto, a central panel being formed by removing a portion of such roughened material. A previously formed and separate hard rim is disposed around the periphery of the panel whereby an exterior roughened surface and interior panel and intermediate depressed channel are formed upon the card when exposed to the pressure of the die.

No. 576,047. Method of Producing Photographs in Relief. H. C. Fairchild, Sandy Hook, Conn.

This method consists in first cutting in the mounted photograph from the rear side thereof a furrowed outline of the portion to be put in relief; then dampening the furrowed outline portion and enclosing the same in a frame with an open mask, the latter being arranged on top so that it will register with the furrowed outline portion, which latter is then moulded into relief through the open mask.

Certificate of Trade Mark, Registration No. 29,495, was issued to The Thompson & Norris Company, Brooklyn, N. Y., for the word "Photomailer" as applied to envelopes.

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Vol. XXIX.
FOUR DOLLARS PER ANNUM.
APRIL, 1897.
Number 4.
SINGLE COPIES, 38 CENTS.

THE PHOTOGRAPHIC TIMES



AN-ILLUSTRATED MONTHLY-MAGAZINE DEVOTED-TO-THE-INTERESTS-OF-ARTISTIC & SCIENTIFIC-PHOTOGRAPHY.



THE-PHOTOGRAPHIC-TIMES-PUBLISHING-ASSOCIATION-60-AND-62-EAST-11TH-ST.-NEW-YORK.

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NEW YORK BY NIGHT
BY WM A FRASER.

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THE PHOTOGRAPHIC TIMES.

VOL. XXIX. APRIL, 1897. NO. 4.

NIGHT PHOTOGRAPHY.

BY W. A. FRASER.



BY BRYANT PARK AFTER THE STORM

HAVING been asked by your editor to describe my method of working in night photography, I would first say that with perhaps the exception of the combination of snow with moonlight and electric lights, and even this may have been done before, I make no claim to originality, my first attempts having been made after reading the articles on the subject, published in the *London Amateur Photographer* by Mr. Paul Martin.

Thanks to these articles, I was enabled to start from the point where Mr. Martin had ceased experiment and reached success, and beyond a supply of energy, and sufficient enthusiasm to disregard storm and cold, I find very little else is needed.

The first requisite is a strong weather-proof box camera. The one I use for this work is an old style Scovill detective, long ago laid on the shelf, but it struck me when thinking the matter over, that its strength and solidity, made it a very suitable instrument for this purpose, and much work done with it during the past winter has confirmed me in this opinion.

I carry a light folding tripod which can be quickly and easily attached to or detached from the camera, as working in the dark with hands numb from cold and wet, the simplest operation becomes a task, and the more simple the apparatus, the better the chance of success.

The lens I use is a Ross rapid symmetrical worked at full opening *f*8. Mr. Martin advises the use of a slow orthochromatic plate, but considering the good quality of the fast plates as now made, and the great advantage gained by reducing the time of exposure, an advantage which one will appreciate after a single trial, I very much prefer them, and results do not, in my opinion, suffer in the least from their use.



ENTRANCE TO CENTRAL PARK

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As halation must be guarded against, I adopted for this work the Seed non-halation plate, and back them as a further precaution.

Working on Mr. Martin's lines I at first included in the exposure a minute or two of the last departing daylight, if it might so be called,



THE GIANT HOTELS, FROM CENTRAL PARK

but my negatives approached too nearly daylight results, and I have since waited until night has really fallen before making the exposure.

Having chosen the view and set up the camera, if the only lights included are gas lamps, the exposure with this lens and plate should be from eight to ten minutes, depending somewhat upon the distance to the nearest light, while, if any near electric lights are included, from two and one-half to three and one-half minutes will suffice.

When I speak of electric lights, I refer to those enclosed in opal shades, such as are used on Fifth and upper Madison Avenue in our city. Unprotected lights or those enclosed in plain glass shades I have never attempted, and doubt very much if they can be successfully photographed.

My moonlight pictures were taken between 10 and 11 o'clock, P. M., with moon almost full, and ten minutes' exposure.

During the exposure, a watch must be kept that no vehicle carrying lights crosses the field of view. My practice is to stand beside the camera, keeping one hand firmly on it, if it is blowing hard, several exposures I found were ruined through movement of the camera caused by the strong wind, then when a cab or other vehicle carrying a light enters the field of view, I, with the other hand, cover the lens until it has passed.

Moving objects not bearing lights makes no impression on the plate.

In the development I aim at softness, and use a rather weak metol developer, two ounces stock solution diluted with water to four ounces, and with very little, say two drachms alkali, no bromide.

The amount of detail picked up by the lens when using this plate, has been a constant source of wonder to me; in every case, very much more than my eye could see, was disclosed when the plate had been developed and fixed.

I prefer a stormy night for this work, either snow or rain, as the artistic effect is unquestionably much greater on these occasions.

Before starting out one's mind must be made up to bear with equanimity all sorts of chaff and uncomplimentary remarks, which are sure to be showered upon the photographer by the majority of the passers by. I have received a great deal of advice and sympathy concerning my mental make-up and condition, and if Robert Burns were still living, I should suggest



MOONLIGHT, CENTRAL PARK

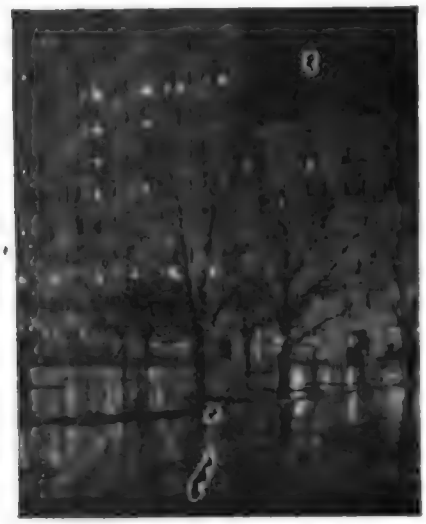
to him that a trial of night photography might partially, at least, fulfil his wish as expressed in the lines

"O would some power the giftie gie us
"To see oursels as ithers see us."

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This is varied by a multitude of inquiries ranging from the sublime to the ridiculous, and also indication that an interest in science is abroad on the streets of New York, as I have more than once heard John explaining to Mary as they passed that I was taking a picture by those X-rays the papers have been talking about.

One very stormy night towards the end of November, when making one of my earliest attempts, I was standing by my camera vainly



THE SAVOY HOTEL, STORMY NIGHT

(as it turned out) trying to get a bit which had pleased me, when I heard a voice outside my umbrella saying, "Say, mister, take my picture." On turning round I found it was my good friend, W. B. Post. Even he had not been able to resist the inclination to chaff a fellow-worker when he found him in what seemed a ridiculous position.

In conclusion, I firmly believe there are great possibilities for pictorial effect in this night photography, and to the enthusiastic amateur, whose daylight leisure hours are limited, a very broad field of work is opened up. I confidently expect to see great improvement, and some startling effects produced, when it has been taken up and studied by a greater number of workers.

NOTE.

In order to encourage our readers in this branch of photography, we offer a silver and a bronze medal for the best photographs made at night. This competition will close on the 30th April next.

INEXPENSIVE ENLARGING FOR AMATEURS. BY G. B. PELTON.

The beautiful effects obtained upon bromide paper and the peculiar capabilities which it possesses, render a knowledge of its manipulation so advantageous to the amateur fraternity that it is surprising that its use among them is not more general.

The busy amateur who has impatiently awaited a few leisure hours which he may devote to the production of prints upon ordinary paper, will find pleasant occupation for his evenings, and increased interest in the art by the production of contact bromide prints by exposure to artificial light, and he who desires to render himself untrammeled by the size of negative or camera will find it of much benefit artistically, mechanically, and economically, to familiarize himself with this printing method before venturing into the fascinating field of enlargement.

The owner of a folding or view camera from which the ground glass can be removed or placed in such a position that it will offer no obstruction to the light rays, and which is fitted with a lens which will cover the largest plate from which it is desired to produce enlargements, possesses the expensive portion of the necessary apparatus, which the outlay of a small sum and some very rudimentary mechanical skill will complete for the purpose of producing enlargements by daylight.

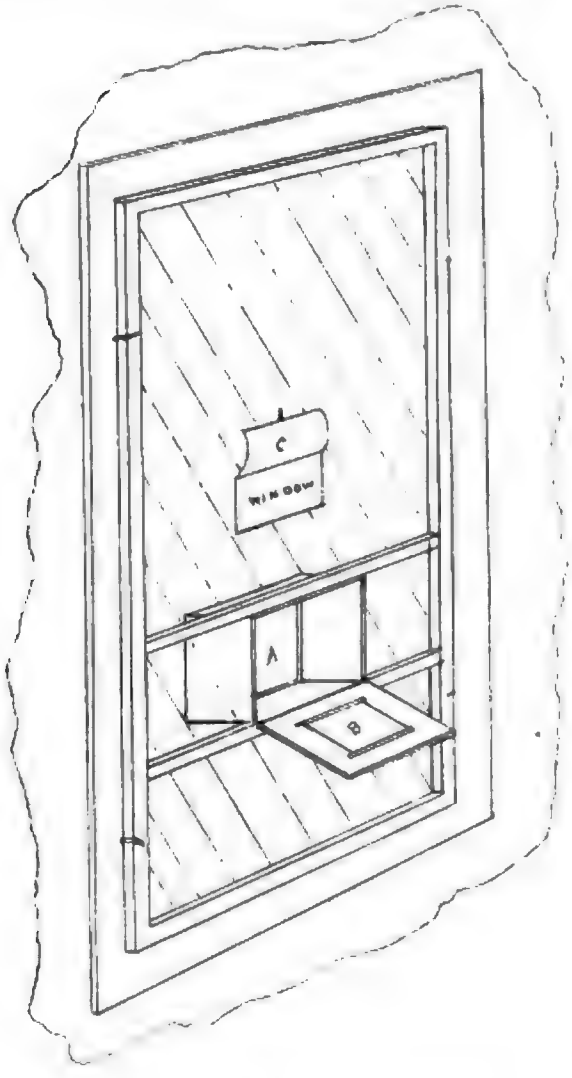
The indulgent family of the aspirant to enlarging honors will doubtless assist him in the selection of a room for his operations from which all rays of actinic light can be easily excluded, as adjacent as possible to his dark room, and which has, preferably, a northern exposure. If the room is of such size as to permit the enlarging easel to be placed eight or ten feet distant from the window, it will be sufficiently large for all ordinary purposes, and a room may even be extemporized by the use of screens, but the window should not be darkened by the light reflected from brick walls or other light-interfering surfaces, and within a distance of a few feet from it, an unobstructed view of the sky should be obtained.

A frame should be constructed of one inch pine about two inches wide, of such size as to fit snugly against the window casing on the interior or room side when the casing is flat, or so free from moulding as to allow it, and if not, of a size which will so fit into the casing as to exclude the light. This frame is easily and

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strongly made by sawing the pieces of pine to the proper length, and joining them at the corners by means of small shelf brackets.

A frame should now be made of one-quarter or one-half inch pine, three or four inches wide, and at least two sizes larger than the largest negative to be used. A ground glass is attached by grooves or small strips of wood to the open side of the frame which is to be exposed to the exterior, and to the bottom of the other



open side is attached by small hinges a door which has a center opening the size of the negative. At the top and bottom of the opening slides are placed which will admit of the easy introduction of the negative, or of kits, should smaller negatives be used.

A strip of cloth eight or ten inches wide, of sufficient density to exclude all actinic rays, and on one edge the exact measurement of the dimensions of the small door, on the other edge large enough to inclose the rear of the camera, to which, when in use, it is closely confined by a draw string of rubber cord, is attached to the outside edges of the door with small tacks.

The small frame should now be firmly fastened with screws to cross pieces which have been attached to the larger frame at such a distance from the bottom as may be convenient for the placing of the camera, usually at the height of a small stand or table. The large frame should now be covered on the exterior side with thick durable paper, or preferably with cloth which can easily be rendered light proof by the application of a coat or two of dark colored paint, and which is so carefully fitted about the smaller frame that no light rays can find an entrance except through the ground glass. A convenient, although not an entirely necessary addition, is a small window of orange or post-office paper placed in a convenient portion of the covering of the frame and covered when not in use with a cloth curtain which may be hooked up. The frame may be held in position when in use by right angled screw hooks, one at the top and one at the bottom of either side, which when turned will hold it firmly against the window casing or by such other means as may be practicable for the user.

Two shallow trays are now made of one-quarter inch pine, planed on both sides, two inches deep, and of a size sufficient for the enlargements desired. For a 16 x 20 enlargement the trays should be 18 x 22. These trays are one for developing and the other for the fixing bath. Still a third tray will probably be found necessary for washing, and this may be made the same size for convenience, but of stronger material than the others. If one inch pine three inches wide is used for the sides, and one-quarter inch pine for the bottom, the tray will be of good size, strong and durable. These trays are each lined with a good waterproof quality of black or green enameled cloth such as is often used for covering desks or tables, and the corners of which must not be cut but turned in, fitted smoothly to the bottoms and sides of the trays and tacked at the top or outside edge. The enameled cloth is inexpensive and can be easily removed and renewed when necessary.

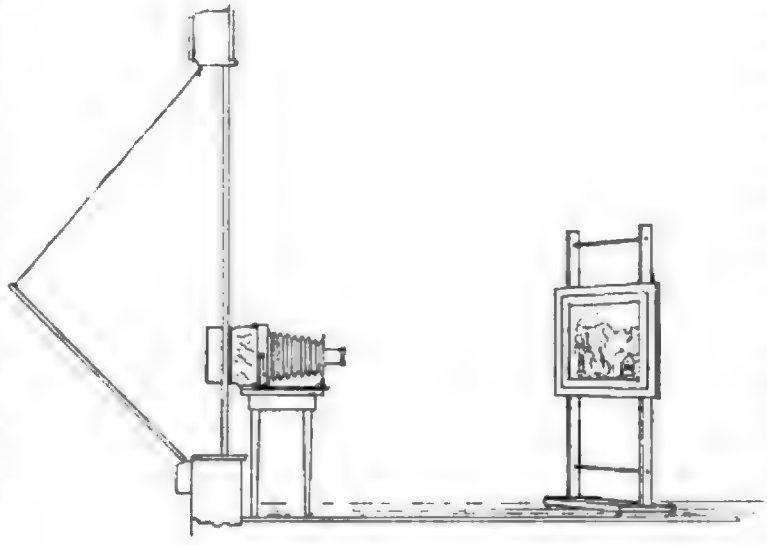
One inch pine two inches wide can be used advantageously in the construction of the easel

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which is shown by the cut, and which is so simply made that a description would be superfluous. Care should be taken to have the uprights perpendicular to their supports, and the board upon which the bromide paper is to be fastened should be well seasoned and smooth. Upon it should be placed a white paper whereon has been accurately ruled in heavy black lines the outlines of the size of the enlargement desired.

A reflecting surface, preferably a mirror, is now placed in such a position and at such a distance from the window that the unobstructed light from above is reflected directly upon the ground glass, and when the developer, clearing and fixing baths have been prepared the operation of enlargement may be begun.

The covered frame is placed in position, the camera, with the ground glass removed, is placed upon a small stand or table, the light-proof cloth fastened about the rear of the camera, the negative with the glass side outward or toward the ground glass to prevent reversal of the image, is placed in the light excluded from the room, and the size and focus of the enlargement obtained upon the easel.



Apparatus in position.

At this time the lens may be stopped down if desired, the intensity of the light considered, and the time of exposure determined. The latter all-important factor is dependent upon a number of variable conditions. The season, the time of day, the clearness of the atmosphere and the density of the negative must all be considered, but experience soon ripens the judgment and a thorough knowledge of the conditions which governed the first successful exposure will assist immeasurably in the comparisons which insure future success. Trial exposures with strips of bromide paper should invariably be made to determine the proper time of exposure when any uncertainty exists.

By the light of an orange or ruby lamp, or that which enters the room through the window in the screen, the bromide paper is pinned to the easel, and it may be well to say that the image should extend slightly beyond the edges of the paper, when possible, in order to avoid trimming.

Development may be safely carried on in a yellow or an orange light of considerable volume, although it has been my practice, and I know it to be a good one, to cover the tray with a piece of cardboard until the image shows plainly. A larger volume of light may then be used, and at a time when all the light consistent with safety is needed in determining the exact instant at which to stop development.

Manufacturers of bromide paper give very explicit directions in regard to its manipulation, which should be rigidly followed except, perhaps, in the matter of developers. Formulæ for several developers are usually given, but I have found much to commend the iron-oxalate developer. With it I have been able to obtain, at will, beautiful velvety blacks and grays, and even sepia tones, by the proper exposure and compounding of the developer.

For this I am largely indebted to an article entitled "Concerning Bromide Prints," by A. A. Adee, and which may be found in the American Annual for 1890.

I have departed from the valuable method of development there recommended only in that the developer is compounded as directed by the manufacturer of the paper which I am using.

Mr. Adee recommends a rather short exposure, and a normal developer to obtain gray

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prints. For dense black prints a few seconds more exposure, and add to ten drachms of developer four drachms of water. For sepia tones a perfect negative, about fifty per cent. longer exposure and three-quarters of an ounce to one ounce of water added to the developer. But the bromide enthusiast in search of sepia tones, until he becomes skilled in the manipulation of the paper, will find it more economical and vastly more exasperating, especially when using platinum-bromide or rough surface paper, to obtain them by means of the hot hypo-sulphite of soda toning bath.

Gradual and slow, but not prolonged development is essential to success in the production of a bromide print or enlargement, and I have obtained a larger percentage of good results by beginning development with old but clear developer, which is gradually strengthened by the addition of fresh developer until the image appears at about the proper time, and which is maintained as nearly as possible at a temperature of 65 degrees. With the iron-oxalate developer the acetic acid clearing bath must be applied liberally and thoroughly or yellow stains will result, and, after fixing, most amateurs who are not provided with a *fin-de-siecle* washing apparatus for large prints may rest tranquilly in the contemplation of permanent results by washing the prints in tepid water, after which he whose judgment fails him not will consign them to the film hardening process of an alum bath, before mounting.

ABOUT PICTORIAL PHOTOGRAPHY. BY E. K. HOUGH.

DEAR TIMES: I have just concluded a leisurely reperusal of your beautiful "Holiday Number."

It is full of good things, both instructive and entertaining, but the article that interested me most was entitled, "Sharp Focus, and Other Matters, by Horsley Hinton," of England.

He states in the clearest manner the distinction between the best so-called pictorial photography and the best technical photography, and points out their relative values so plainly that no one need ever be misled by unfair claims or specious reasoning.

He emphasizes the difference between good pictorial photography and bad technical photography, and shows how those incapable of making or judging either kind well, endeavor to palm off their imperfect technical efforts as pictorial triumphs. His well timed and strongly expressed opinions may keep some young beginner from the false notion that bad technical work is in any sense good pictorially, just because it is bad technically. Good technical work is produced by doing perfectly definite work for producing perfectly definite results, and although trained artistic perfection might pick out of many technical failures some that possessed interesting pictorial effects, yet the best pictorial work would be planned for and produced with the same definite intention, and the same skillful use of the best technical means, as the best purely technical photography.

The photographer or artist who will achieve the best pictorial effects with least expenditure of time, materials, and labor, will be the one who is most nearly master of all technical resources.

The best pictorial effects will never be gained by aiming at good technical photography and trusting to luck for missing it in a pictorial way.

A true artistic aim backed by the best technical skill will always achieve the best pictorial results.

If the amateur or beginner imagines that he can escape from the discredit of his inability to acquire skill in pure technical photography by taking refuge in pictorial photography he will lose much time in vain effort. He will be in the dilemma of the man who imagines he can write poetry before he has acquired the grammar of his language enough to write good prose.

Artistic or pictorial photography is the higher or poetic evolution of good photography, not the lower refuge of incapacity. Yet, as many men can write strong and eloquent prose who have no talent for poetry, so many photographers may make almost perfect work technically who would fail to achieve pictorial superiority for lack of the pictorial or artistic instinct—the best artistic talent being more a born instinct than an acquired accomplishment.

But the greater always includes the less, and very few will ever make any great success pictorially who have never taken pains to acquire skill for good work technically.

Such articles as that of Mr. Hinton do great good by preventing false estimates of value, and and giving credit for genuine skill and deserving work where it truly belongs, instead of

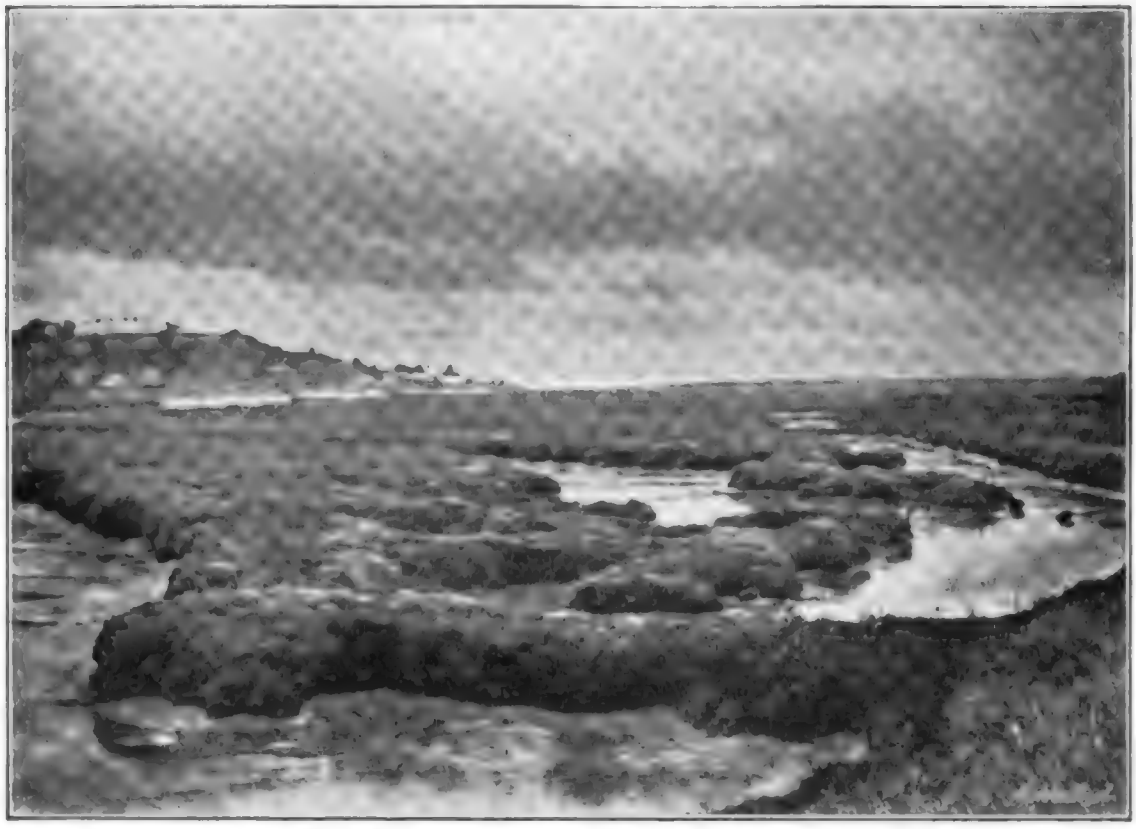
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AN ARMENIAN PRINCE

BY F. H. DAY

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IN THE THAMES ESTUARY BY A. HORSLEY HINTON

pampering ignorant conceit by praising effects, often the result of incapacity instead of superior ability.

Mr. Hinton's comment on the false notion that a so-called pictorial photograph is more valuable if if looks like a painting or an engraving, is also very timely, because in some influential quarters they are recommending that very thing.

We all know how many thousands of dollars have been paid for so-called "Old Masters," not because the buyers thought them more beautiful than modern pictures, nor because they appreciated the real qualities that made them artistically valuable in spite of their defects, but simply because it was the fashion to take pride in possessing such pictures as evidence of wealth and pretensions to artistic taste.

So, doubtless, many buyers of so-called "Pictorial Photographs" buy them not because they really admire them more, or because they fully appreciate the qualities that make them valuable—when they have any—but mainly because it is the pride of wealth and fashion to have something as unlike the common prevailing style as possible, and even if it is inferior in real genuine good quality, so long as it is rare and singular, they pride themselves on having it, as something everybody does not possess.

It may be legitimate for photographers to profit financially by catering to this false pride, but it is not well for them to be misled into actually thinking that an imperfect imitation of a painting or engraving is better than a well made, honest photograph.

PHOTOGRAPH THE RIGHT THINGS. BY ELLERSLIE WALLACE.

Among the would-be critics of photographic work there are some who are continually fault-finding on the score of inartistic effects. Are they justified, or not, in their opinion?

Before answering this question, let us devote a little time to examining some of the work done by artists who can dispense with all pho-

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tographic drawbacks and show their individual feelings with ease; as, for instance, painters and pictoral designers in general. Thus, taking examples easily accessible, we may run over the past few years' issues of our illustrated magazines of the better quality, and finish off with the catalogues of the Paris Salon. Now, putting aside the variable percentage of work showing actual genius which may generally be found in these collections, I think any fair-minded person will admit that we are confronted with very numerous specimens disgusting and tiresome, simply because the artist had neglected what is beautiful, and voluntarily selected commonplace or revolting subjects.

I do not at all propose to enter into any metaphysical discussions about the function of art, but I do say that the world is full of beautiful and interesting objects, and that it is the clear and manifest duty of those who deal with pictorial arts to select those subjects rather than the opposite, to which I have alluded.

I do not at all class in this category historical records of disasters and other things of the kind. If present at the time, I should be the first to focus my lens on a railway wreck or the ruins of a town destroyed by a cyclone. Nor would I refuse to lend my photographic powers to the assistance of anything that medicine or surgery might ask of me. All this and much more I would gladly do. But when free to select my materials *for the making of a picture*, am I justified in choosing poor ones rather than good? Shall I go down behind the barn and expose plates on some neglected corner, and then try to cover up the defects of the resulting picture with a double-printed sky, or, perhaps, a sentimental quotation from some poet obtruded on the card mount? Shall I pose my models in scenes of distress, of grief, and of violence, instead of in some position showing the enjoyment of life and the pursuit, if not the realization, of happiness?

Again, I ask those who may read this article, to look over recent art publications, and notice how many of the groups and portraits partake of the former character. And this, too, not from any want of cheerful subjects! We are driven to the conclusion that modern artists are becoming pessimists when we see them make such choice. Shall we photographers imitate them, or, worse yet, give them similar opportunities of imitating us?

Now, I know that most men who call themselves "artists" will indignantly disclaim that they ever imitate the work of the camera. Nevertheless, there can be no question that of later years photography has been one of their most efficient teachers. The intimate structure of leaves and plants, water in motion, reflections in water, cloud-forms, and particularly perspective, are all so perfectly rendered by the camera that no one dealing with arts of design can afford to neglect the study of such effects in photography. So far, then, I think it is not unfair to say that the mahl-stick does imitate or depend in some measure upon the camera. But we notice only too often that instead of utilizing the photograph for its legitimate purpose, *i. e.*, as a tutor of detail, the gentlemen of the brush just *transfer detail and defects together* into their work, which will then actually smell of the camera, so to speak. Instead of making proper selection between the sightly and the unsightly, we notice in many instances the grossest faults of photography (in the artistic sense) boldly and wantonly repeated on the canvas. In landscape this is becoming more and more evident. The principal subject is elevated far above the middle of the canvas, leaving unduly large stretches of barren foreground filling up the lower portions. And I have seen numberless examples where such exaggerated foregrounds seem to have been selected *on account of their monotony*. Country roads with ruts and mud-puddles; fields of stubble without ever a rock or flower to afford a little variety—and much more to the same effect. Good photographers have long paid attention to these matters, and choose their point of view with the greatest care, making free use of the trimming knife to remove from the finished print these monotonous foregrounds or skies; but it is strange that artists seem to copy the very defects that used to be seen in the crude early efforts of the camera.

The march of modern improvement has now given us the startling Vitascope, or photo-reproductions of life. How beautiful to see the picturesque crowds of a busy city street or seaport move over the lantern screen. How thrilling, and yet painful, to see the horses gored by the bull in the arena and the "toreadors" skipping nimbly aside! Let us ardently hope that no *progressive* disciple of Daguerre will ever attempt to thus record the horrors of the battlefield. Some painters have done this—more shame to them; in one well-known case the public authorities interposed and properly forbade the exhibition of a series of atrocious

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BURNHAM VILLAGE BY A. HORSLEY HINTON

scenes on the battlefield and after it. Let us hope that if similar outrages are committed by the camera they may be as promptly suppressed.

The world is still beautiful; mountains, skies, seas, foliage, and loveliness of all kinds, is ready and waiting to be depicted. Let us do our full duty by it, and thus protest against the common and the unclean in picture making.

METHOD OF MEASURING THE SPEED OF CAMERA SHUTTERS.

CAPTAIN W. de. W. Abney explained before the Camera Club, of London, a short time ago, his method of measuring the speed of photographic camera shutters, which has special advantages as regards accuracy and facility of record, brought about in a somewhat novel manner. In a report of his lecture, which we extract from the London *Amateur Photographer*,* are several interesting facts. The lecturer pointed out that it was quite as important to know whether we were giving an exposure of, say, $\frac{1}{25}$ or $\frac{1}{15}$ of a second as one of 5 or 15 seconds. The apparatus enables us not only to measure the time of exposure, but also causes any kind of shutter to draw its own diagram, and from this diagram several things are made known, e. g., how long it took to open, and to close, and how long the working aperture of the lens was fully open, etc. —three points of very great practical importance. The apparatus employed is somewhat as follows:

A source of light; in this case the electric arc, but magnesium can be used; the essentials being a steady and strong actinic light.

A supplementary positive lens. This is so placed that it throws an image of the carbon points upon the lens in the front of the camera.

The electric arc lamp will be noticed at the right hand of the end of the engraving, which projects a beam of light upon the condensing lens supported on a stand, and this in turn concentrates the beam upon the shutter to be tested, which is held in an upright stand next

* We are indebted to the *Scientific American* for the loan of the cuts illustrating this article.

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to its left. The actuating bulb of the shutter will be seen upon the table. Different makes of shutters can be held by this stand. The stand next on the left supports a spectroscope tube without any lens, having the slit two

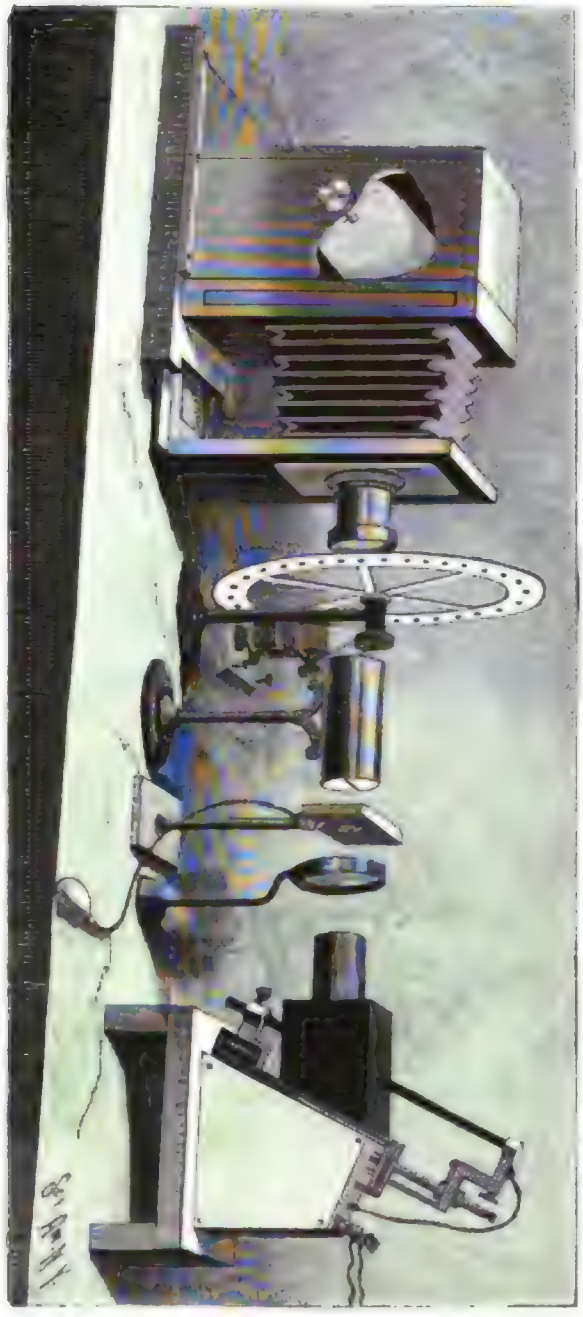


FIG. 1. APPARATUS FOR MEASURING THE SPEED OF SHUTTERS

inches long by $\frac{1}{10}$ of an inch wide, in a horizontal position. A cardboard with a slit cut in it, inserted in the tube, answers as well as the regular slit. The condensing lens is adjusted with reference to the light so as to fully cover the whole of the horizontal slit. The motion of the shutter is in the direction of the length of the slit in the card.

At the left of the spectroscope stand is a rotating circular cardboard disk divided into six sector openings divided only by a narrow radial bar. The apparatus reminds one of a wheel with only six spokes. Along the rim are punched out a series of small holes, equidistant. Six of these holes correspond to each sector opening, so that there are thirty-six holes in all. The apparatus is made to revolve (about its center) in a vertical plane just in front of the lens of the camera, and as each spoke of the wheel passes in front of the lens, and is parallel to the slit in the tube, it intercepts the light. The wheel is made to revolve at a uniform speed by a small electro-motor which will be seen to the left of it. It is important to know the wheel's rate of revolution. This may be done in two ways. First, by blowing air through a small tube perpendicular to the plane of the sector and just opposite the row of the thirty-six holes, it becomes (effectively) a siren. The pitch of the note gives the number of air puffs passing through the holes, and so the rate of revolution is known. For example, suppose the air puffs gave a note agreeing with a tuning-fork which was known to vibrate 720 per second, we should know that 720 air puffs had passed through the tube and holes opposite in a second. Dividing this number by the number of holes in the rim, viz., thirty-six, we get twenty complete revolutions per second, and since there are six spokes in the wheel, one spoke would follow its neighbor in front of the lens in $\frac{1}{120}$ of a second.

A second method, and the one employed on this occasion, was that of pressing into our service an old turnstile counting apparatus. This was attached to the axis of the revolving sector, and its index watched for a set time, say 10 seconds, the number read off and divided by 10 to give the number of revolutions per second.

Behind the sector wheel is seen the lens and camera arranged in the same plane with the other parts of the apparatus, having a special chamber in the rear, holding a metal drum five inches in diameter, extending transversely across the interior of the camera to its full width. The drum turns about a horizontal axis that is parallel to the slit in the spectroscope tube and perpendicular to the optic axis of the line of the apparatus. One end of the axis projecting through the side of the camera has a pulley disk

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on the end. The cylinder may be seen through the broken portion of the camera. The camera lens is adjusted to throw a sharp image of the slit in the spectroscope, upon the center of the surface of the cylinder in the camera. The cylinder is covered with a strip of sensitive (e. g., bromide) paper held in position by elastic bands.

In place of the cylinder of bromide paper a circular sensitized glass plate can be fixed in a vertical plane in the back of the camera and made to rotate or whirl at a given speed, the flashes of light through the slit impressing it in the shape of radial lines, their number determining the rapidity of the shutter.

If now light from the lantern passes through the slit lens, etc., on to the front of the revolving paper on the drum, it would trace on the paper a rectangle image of the same width and length as the slit, the vertical length depending upon the rate of the drum revolutions, i. e., how much paper turned past the image of the slit. If the sector be set revolving, every time a spoke or bar came in front of the lens it would cut off the light while it was passing. On developing the paper we should have a dark rectangle crossed by bars of light corresponding to the transits of the spokes. Suppose now the shutter to be of that form which causes a rectangular opening to pass in front of the lens. As the beginning of the opening was commencing to travel across the slit we should get an image of a portion only of the slit formed on the front of the revolving drum, and similarly as the opening commenced to close it would cut off more and more light from the slit, and so on, the image dwindling from a line to a point.

In Fig. 3 we have some such result. If we suppose the drum and sector to be stationary, we should get an image of the slit as a straight line as $H_1 H_2$. If the drum revolved and the sector was stationary, this straight line would be drawn out into a rectangle. If the sectors revolved, we should find this interspaced with clear parts, but suppose the shutters to commence slowly opening at the end H_1, and go on until the whole slit $H_1 H_2$ were fully covered by light for a time and then begin to close up again from H_1 toward H_2, the sector and drum revolving at the time, we should have some such figure as N M K L. The triangular part, M M′N, corresponding to the time the shutter took to get fully open, the rectangular part, M M′ L L′, being the time that it remained fully open, and the triangular part, L L′ K, the period of closing. On further examining this diagram we note two complete bar spaces, and a little portion outside each, together equal to about that between two clear spaces. If now the sector were revolving at the rate above supposed and described i. e., $\frac{1}{120}$ second between each bar space, we should say that the shutter took then something between two and three such intervals to open, say $\frac{1}{240}$ to $\frac{1}{480}$ second to get fully open; remained fully open about two spaces, i. e., say, $\frac{1}{240}$, and closed in a little more than one space, $\frac{1}{120}$ to $\frac{1}{180}$ second. The ideal or theoretical perfect shutter is one which takes no time to become fully open and to close as quickly, but as this is as yet not a practical thing, we have to accept this as a mental con-



FIG. 3.

ception, and compare the actual performance of any shutter with it by contrasting its practical efficiency with its theoretically possible efficiency; we thus need but compare the area, M M′ L L′, i. e., the period of full opening, with the corresponding area, N N′ K K′, i. e., the base, N K′, with base, L M′.

In Fig. 4 we have two other diagrams yielded by shutters opening and closing at the center. The areas inclosed by the dotted lines correspond to the ideal unit of efficiency. We can see at a glance that the A shutter is much more efficient than the other, *i. e.*, B form, which latter takes quite a comparatively long time to open as compared with the time it is fully open, but

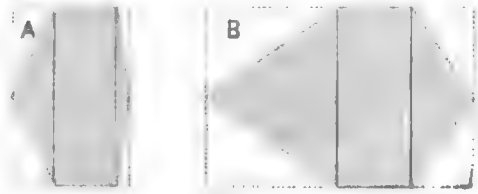


FIG. 4.

closes quicker than it opens. Examination of many shutters has led the lecturer to the conclusion that very few of them had more than about 65 per cent. efficiency.

When working the apparatus as above described, when the speed of the sectors and bars was a knowable quantity, there was no necessity

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to measure the speed of the revolving drum. All that was required was a fairly steady motion, and that it be fast enough. This the lecturer easily attained for the demonstrated experiments by revolving the projected axis by means of the fingers or a piece of string in the same way that one may cause a top to spin. If, however, the measuring of the speed of the sectors be a difficulty or objection, the following device may be substituted: a vibrating (tuning) fork of known frequency has attached to one of its arms a small reflecting mirror, which throws an independent point of light through the lens on to the face of the drum. When the fork is made to vibrate and the drum to revolve, the light from the small reflector traces a wave curve, and since the frequency of the fork's vibrations are known, this wave curve forms a time scale alongside the slit diagram. Examples of this method were shown upon the screen.

Numerous examples were shown and explained, one especially demanding mention being that of a shutter which, when set at a rather slow speed, gave a fairly satisfactory record of its performances, but when set at higher speed clearly betrayed the fact that it rebounded to such an extent that a slight secondary exposure was made. Under such circumstances obviously it would not be likely to yield satisfactory negatives. This shutter acted satisfactorily at about $\frac{1}{25}$ second, but when its speed was about $\frac{1}{60}$ or $\frac{1}{70}$ the rebound exposure rendered it useless. A drop shutter, with elastic band, giving an exposure from start to finish of about $\frac{1}{700}$ second, yielded a diagram similar in shape to that in Fig. 3, but the time during which it was fully open was only about $\frac{1}{300}$ second. Generally speaking, the smaller the stop, the higher the efficiency.

TWO PHOTOGRAPHS. BY SHAPOOR N. BHEDWAR.

"The Fine Arts illustrate Religion willingly, because it affords good subjects, and there is nothing in the artistic spirit in any way incompatible with the purest spirit of devotion; indeed art draws us continually towards a state of mind akin to the devotional; by requiring us to spend our time in the conscious contemplation of the work of the Supreme Artist."—*Hamerton.*

The peculiar title of the photograph, viz., "Samadhi," or "In Trance," as well as of its companion picture, "In Commune," requires some explanation to those who are unacquainted with the true import of this word amongst the Orientals. The word Samadhi in Sanskrit is used for spiritual ecstacy. It is a state of complete trance induced by means of mystic con-



IN TRANCE BY SHAPOOR N. BHEDWAR

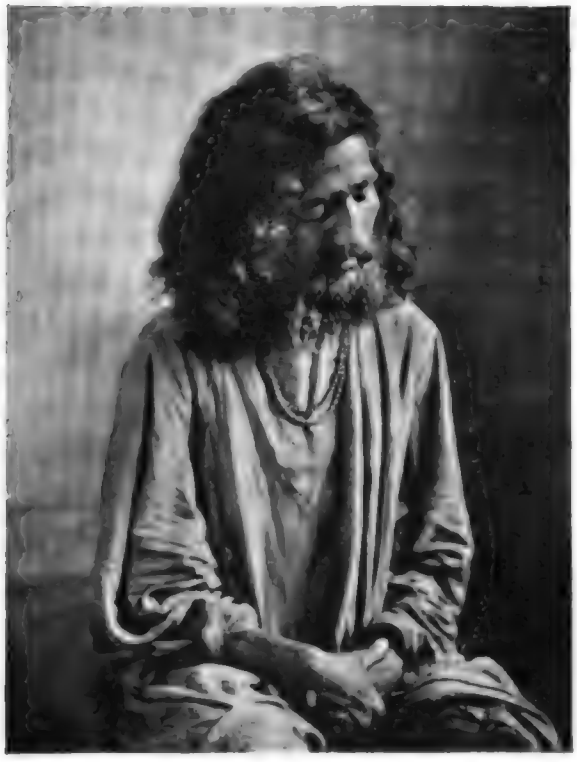
centration. It is by a long life spent most virtuously that this state of intense meditation is to be successfully attained. The practice of this is confined to those persons who have trained and subjugated their will-power to such an extent as to be able to concentrate all the powers of the body and mind in one point, leading thus to the entire absorption of the higher spiritual consciousness in the primordial essence. By a total forgetfulness of all the animal instincts, desires, passions, and one's lower self, the individual is held to attain that spiritual vision by which he is enabled to move over higher planes of spiritual existence and manifest those powers which are denied to ordinary mortals. It is in such a state only that the person is enabled to see the full sequence of his previous births and is capable

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of tracing one after one the line of his lives hereafter. It must be in such a state of divine afflatus that the poet must have uttered these immortal words:

> "Our life is but a sleep and a forgetting;
> The soul that rises with us, our life's star,
> Hath elsewhere had its setting,
> And cometh from afar."

Such intimations could only have possibly occurred to one who was thoroughly religious, and devout in soul, thought and deed. The



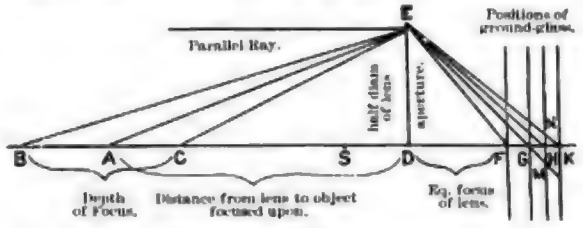
IN COMMUNE BY SHAPOOR N. BHEDWAR

look of pious resignation, devotedness and intense suffering has been so portrayed that the lips, though closed, yet seem to lisp eloquently:

"Be humble, devout, silent, that so thou mayest have communion with the pure spirit: withdraw thyself often into the sanctuary of thy inmost consciousness, become once more point and atom, that so mayest thou free thyself from space, time, matter, temptation, dispersion; that thou mayest escape the new organs themselves and thine own life."

DEPTH OF FOCUS. BY CHARLES E. MANIERRE.

THE object of the following discussion is to develop two formulæ by which the depth of focus of a lens of any given focal length and aperture may be found, and also to demonstrate that if the depth of focus becomes infinite when the lens is focussed at a certain distance, objects at half that distance will also be in focus.



Given the equivalent focus of lens, the size of the lens diaphragm, and the distance of the object focused upon, to find the depth of the focus, or the distance of the nearest and of the farthest object which will be in focus.

In the diagram it will be noted that the parallel rays of light are shown as coming to a focus at F; rays from B at G; rays from A at H; and rays from C at K. S is a point one focal length in front of the lens.

In the following discussion all the distances are in inches unless specially noted.

D=The given distance (in inches) to the object focused upon (A in diagram) measured from the point S, which is one focal length in front of lens.

D'=The unknown distance (in inches) of the nearest object (C in diagram) which will be sharply defined when the point A is focused upon, measured from S.

D''=The unknown distance (in inches) of the farthest point which will be sharply defined (B in diagram) when the point A is focused upon, measured from S.

d=The distance that the ground glass must be moved back beyond the equivalent focus (*i. e.*, the focus for distant objects) to focus upon an object at the distance D [being FH in diagram].

d'=The distance that the ground glass must be moved back beyond the equivalent focus to focus upon an object at the distance D' [being FK in diagram].

d''=The distance that the ground glass must be moved back beyond the equivalent focus to focus upon an object at the distance D'' [being FG in diagram].

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f = the equivalent focus of the lens.

y = The distance beyond the ground glass to the plane where the rays from D focus when D has been focused upon, [HK in diagram].

y' = The distance towards the lens from the ground glass to the plane where the rays from D' focus when D has been focused upon, [GH in diagram].

NOTE.—The ground glass is deemed to be in the plane of H and is not moved.

h = The diameter of the circle of confusion. The usual value assigned to h is $\frac{1}{100}$ inch.

In the diagram h is the distance from M to N and is the diameter of the base of a cone of light having its apex or focusing point at K, and made up of converging rays from C. It is also the diameter of the base of a cone of light having its apex or focusing point at G, and made up of diverging rays from B, which have focused at G.

The circle of confusion depends upon the fact that the unaided human eye cannot distinguish between two points which are separated by no more than one minute of arc; or, in other words, if lines are drawn from each point to the eye, they make with each other an angle of not more than one minute. If the eye is about 28 inches from a photograph containing the two points the minute of arc is about $\frac{1}{100}$ of an inch in length. If the eye is only about 10 inches distant the minute of arc is only about $\frac{1}{360}$ of an inch in length.

We assume the well-known equation $D - f = \frac{f^2}{d}$ in which D is the distance from the lens to the object focused upon.

But as we have defined D to be that distance less one focal length, the equation becomes

$$D = \frac{f^2}{d} \quad (1) \qquad \text{or} \qquad d = \frac{f^2}{D} \quad (2)$$

and we have also

$$D' = \frac{f^2}{d'} \quad \text{and} \quad D' = \frac{f^2}{d'}$$

By reference to the diagram it will appear that $d' = d + y$ and that $d' = d - y'$. Substituting these values for d' and d' we have

$$D' = \frac{f^2}{d + y} \quad (3) \qquad \text{and} \qquad D' = \frac{f^2}{d - y} \quad (4)$$

By reference to the diagram it will appear on the geometrical principles of triangles that

$$HN : DE :: HK : DK$$

and substituting for HN its equivalent $\frac{1}{2}$ h, for DE its equivalent $\frac{1}{2}$ a, for HK its equivalent y, and for DK its equivalent $f \times d \times y$, we have

$$h : a :: y : f + d + y$$
$$\text{or} \quad ay = h(f + d + y)$$

Substituting for d its equivalent as per equation (2), we have

$$ay = h\left(f + \frac{f^2}{D} + y\right) = hf + \frac{hf^2}{D} + hy$$

$$ay - hy = hf + \frac{hf^2}{D}$$

$$y = \frac{hf + \frac{hf^2}{D}}{a - h} \quad (5)$$

Returning to the equation (3) and substituting therein the values of d and y found in (2) and (5), we have

$$D = \frac{f^2}{\frac{f^2}{D} + \frac{hf + \frac{hf^2}{D}}{a - h} - \frac{f}{\frac{af + Dh}{(a - h)D}}} = \frac{f^2}{\frac{af^2 - hf^2 + hf^2 + Dhf}{(a - h)D}}$$

$$D = \frac{(a - h)Df}{af + Dh} \quad (6)$$

By reference again to the diagram we obtain the proportion

$$MH : DE :: GH : DG$$

and substituting for the several lines their equivalents, we have

$$\tfrac{1}{2}h : \tfrac{1}{2}a :: y' : f + d - y'$$
$$\text{or} \quad h : a :: y' : f + d - y'$$
$$ay' = hf + hd - hy'$$

Substituting for d its equivalent (2) $\frac{f^2}{D}$, we have

$$ay' = hf + \frac{hf^2}{D} - hy'$$

$$ay' + hy' = hf + \frac{hf^2}{D}$$

$$y' = \frac{hf + \frac{hf^2}{D}}{a + h}$$

Returning to the equation (4) and substituting therein the values of d and y' found in (2 and (7), we have

$$D' = \frac{f^2}{\frac{f^2}{D} - \frac{hf + \frac{hf^2}{D}}{a + h}} = \frac{f^2}{\frac{af^2 + hf^2 - hf^2 - Dhf}{(a + h)D}}$$

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PORTRAIT

BY F. H DAY

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$$= \frac{f}{\frac{af - D\,h}{(a + h)\,D}}$$

$$D' = \frac{(a+h)\,Df}{af - Dh} \qquad (8)$$

Having found the values of D′ and D″ by equations 6 and 8.

D′—D″ = Depth of Focus in inches.

For use it will be found more convenient to arrange equations (6) and (8) as follows :

$$D = \frac{(a-h)Df}{af + Dh} = \frac{\frac{af - hf}{h} D}{\frac{af}{h} + D}$$

$$\frac{(a + h)Df}{af - Dh} = \frac{\frac{af + hf}{h} D}{\frac{af}{h} - D}$$

Inasmuch as + h and — h in the respective numerators are of very small value, and do not materially affect the result for ordinary purposes, they may be omitted, and to obtain the values of D′ and D″ in feet the numerators may be divided by 12 and the equations will then be

$$D = \frac{\frac{af}{h} \times \frac{D}{12}}{\frac{af}{h} + D} \qquad (10)$$

$$D' = \frac{\frac{af}{h} \times \frac{D}{12}}{\frac{af}{h} - D} \qquad (11)$$

For example :

Given the distance focused upon as 20 ft. (or 240 inches) ; the Eq. focus of lens 8 in. and the diaphragm f16 (or 2 in. in diameter).

$D = 240$
$f = 8$
$a = \frac{1}{2}$
$h = \frac{1}{120}$

$$\frac{af}{h} = \frac{1}{2} \times 8 \times 120 = 480$$

$$D = \frac{480 \times \frac{240}{12}}{480 + 240} = \frac{9600}{720} = 13.3 \text{ ft.}$$

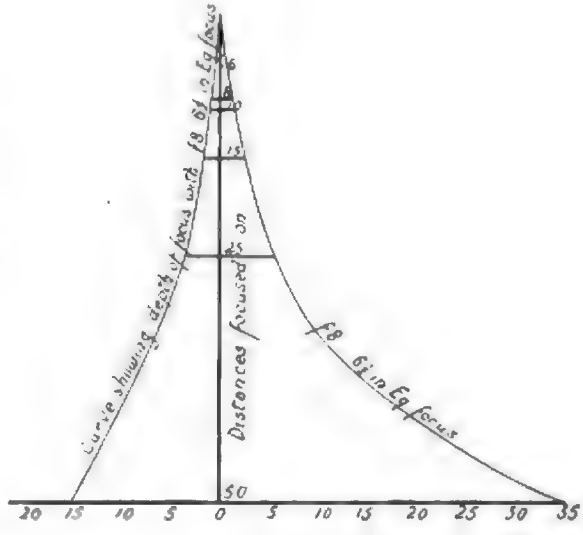
$$D' = \frac{480 \times \frac{240}{12}}{480 - 240} = \frac{9600}{240} = 40. \text{ ft.}$$

That is to say, the nearest object in focus will be distant 13.3 ft., plus the focal length of the lens, and the farthest object in focus will be distant 40 feet, plus the focal length of the lens ; and the depth of the focus will be D′ — D″ or 26.7 feet.

If however h be given a value of $\frac{1}{240}$ of an inch the same example will show D′ = 17.1 ft. D″ = 24. ft. and the depth of focus only 6.9 ft., these being the limits of the sharpest definition that would be demanded in any case.

Assuming that h is given a value of $\frac{1}{180}$ inch. the limits would be somewhat enlarged and for most purposes might be deemed satisfactory.

The curves in the drawing herewith show the increasing depth of focus of a 6½ in. Eq. focus at f 8, h being taken at $\frac{1}{240}$.



The vertical scale shows the distances focused upon ; the figures reading to the left show the depth of focus from the point focused upon measured towards the lens ; and the figures reading to the right show the increasing depth of focus from the point focused on measured toward infinity.

For the same equivalent focus but with smaller stops the curves would separate more rapidly and be entirely outside of those shown, while for lenses of longer equivalent focus with the same stop the curves would be inside of those shown, and would separate more slowly. It is also to be noted that the range from absolute sharpness to what would be deemed out of focus bears a close relation to the depth of the focus, and the smaller the depth, the less room there is for graded definition. For example if

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the depth is fifteen feet, it may be that objects five feet outside the limits are sufficiently defined, while, if the depth is only one foot, objects only six inches outside the limits may not be sufficiently defined.

When D is just sufficiently great to give an infinite depth of focus, objects at half the distance will also be in focus.

Returning to equation (11), that is

$$D' = \frac{\frac{af}{h} \times \frac{D}{12}}{\frac{af}{h} - D},$$

It will be apparent that, when D equals $\frac{af}{h}$, the denominator $\frac{af}{h} - D$ will equal zero, and therefore the whole fraction will equal infinity and the value of D' will be infinite. In such case $D = \frac{af}{h}$. Dividing by 12 to obtain the value of D in feet and substituting for h its value $\frac{1}{120}$, we have

$$D = \frac{\frac{af}{12}}{\frac{1}{120}} = 10af,$$

that is to say, the depth of focus becomes infinite when the distance (in feet) focused upon equals ten times the equivalent focus multiplied by the diameter of the lens aperture.

Let n = the ratio of aperture to Eq. focus. Then $a = \frac{f}{n}$ and, substituting this value in the last mentioned equation, $D = 10af$, we have

$$D = \frac{10\,f^2}{n}$$

This is the usual expression of the equation, showing when the depth of focus becomes infinite.

The above is an exact result and is not affected by the omission of the + hf in the numerator of the equation from which it is derived.

It is manifest, however, that when D has the value last assigned to it that the depth of focus, beside reaching to infinity from the point focused upon, extends also some distance towards the lens.

Returning to equation (10),

$$D = \frac{\frac{af}{h} \times \frac{D}{12}}{\frac{af}{h} + D},$$

and assuming that $D = \frac{af}{h}$ and substituting this value of $\frac{af}{h}$, the equation becomes

$$D' = \frac{D \times \frac{D}{12}}{D + D} = \frac{\frac{D^2}{12}}{2D} = \frac{D}{24}$$

Therefore D' (in feet) equals D (in inches) divided by 24, or where D is also given in feet.

$$D' = \tfrac{1}{2} D$$

That is to say, that when the lens is focused upon that distance which will just enable it to give an infinite depth of focus, the depth of focus will begin at a point half way between the lens and the distance focused upon.

It must be remembered that all measurements are made from one focal length in front of the lens.

The above statement is correct for any value of h which may be determined on, but is not quite exact, as it is slightly affected by the omission of — hf in the numerator of one side of the equation from which it was derived. However, this is not important, as the result of including it would be to *increase* in a very slight degree the depth of focus.

JANUARY, 1897.

COPYING AMBROTYPES. BY MRS. HELEN BUTLER WEBSTER.

NEARLY every one has among his possesions some choice old daguerreotypes or ambrotypes. I have many of these quaintly dressed family "likenesses," and have frequently been importuned by my less favored cousins for copies, but since copies usually appear flat, grotesque, and lifeless, I have not cheerfully responded.

Being recently more urgently begged by one whose right, save possession, was equal or greater than my own, for the original or a copy of a favorite brother's ambrotype, a brother who is now a dear memory, I have succeeded in making some really beautiful prints, by a method which seems to me to be new. I have

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SALOME F. H. DAY

talked to several well-versed amateurs, and as I find the method new to them as well, I venture to place it before those of your readers who may not know what is perhaps well-known to the professional.

I found among the ambrotypes many different vehicles used to cover the backs, the oldest ones appearing to have a thin coat of silver to bring out the lights, while the shadows are produced by a velvet ground; next, if judging from the chronology of my pictures is a criterion, the velvet is abandoned by the substitution of various dark coatings run over the back of the negative; later, no vehicle is used, but the exposure appears to have been made directly on a dark purplish red glass.

In printing, I placed the sensitized paper,—I use platinotype,—in contact with the ambrotype, by removing the case and velvet background, using the ambrotype as a negative. The exposure essential to print in most cases is from 18 to 22 seconds, the red glass, however, requiring nearly seven minutes to secure a good result. I have found but one with the vehicle too dense to allow printing.

While this method may be known to those older in the art, to many amateurs it will be new, and to me it has been a pleasant little discovery.

PHOTOGRAPHING WITH THE EYE OF A BEETLE. BY GEO. F. ALLEN, M.D.

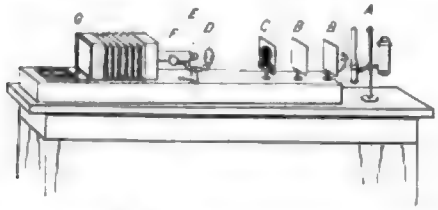
One of most interesting slides of the microscopist's collection has long been the cornea of an insect, (usually a beetle,) arranged so as to show at the focus of each of its hundred of lenses a picture of some object. This has been commonly called the multiple image, and is a never failing extractor of Oh! My's! when seen for the first time.

It occurred to me some five or six years ago while doing other photo-micrographic work, to try to photograph the multiple image. My first efforts proved complete failures, and it was only after repeated experiments with various eyes and different subjects that I finally succeeded more than a year afterwards. The best cornea I used

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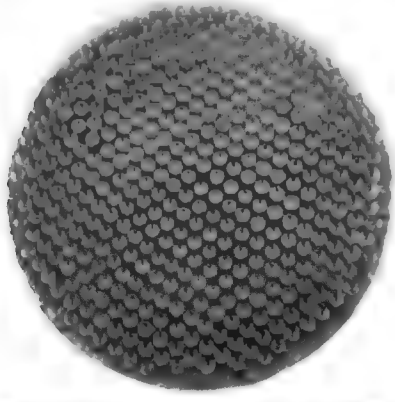
was that of the beetle *Hydrophillus Piceus*, from which I punched out a minute circle containing about 400 lenses and mounted it in balsam fir, pressing it out as flat as possible. The subject should have strong contrasts and be without too much detail, a silhouette with exaggerated features seemed to suit the case best.

By reference to the diagram, the arrangement of apparatus will be best understood. A student lamp furnishes the illumination; the light being modified by at least two ground-



glass screens, B B, then comes a three-inch silhouette C, also on ground-glass, and to prevent the pictures overlapping each other, all light except a four-inch circle around the silhouette is cut out by opaque paper.—This circle is not shown in the cut.

The slide of beetle's lenses is held by the stage of a microscope inclined to the horizontal and its eye piece thrust into the front of an ordinary camera. I want to emphasize the fact that the microscope has nothing to do with the formation of the picture, but simply enlarges it and conveys it into our camera. The image is formed in the air at E, and it would certainly be possible by placing a plate at that point to take the photo there; but it would require a microscope to see when you had it focused, a micrometer screw adjustment for your plate, and a microscope every time you wanted to look at your finished work: so I used the microscope once for all, and enlarge the image before it reaches the plate.



PHOTOGRAPH WITH THE EYE OF A BEETLE

The exposure is made as in other photomicrography by an opaque object interposed anywhere between the light and the camera, preferably between C and D. Obviously no condenser or substage is used on the microscope. An ordinary plate is used and developed in the usual way.

It has been erroneously stated in several papers that this work was done in investigating the subject of insect vision by X-rays. As you see by the foregoing it was done long before the X-rays was discovered. Nevertheless, it shows very conclusively that insects do not use X-rays in vision any more than other animals. The X-rays are not refracted by lenses, and nature would never develop such an elaborate dioptric system unless it were to be used.

Photographers will be struck with the similarity between this group of pictures and the gem and stamp pictures taken with what I think were called gang lenses, and this is true with my *flattened* cornea; but in the unmutilated eye of the beetle all this is changed. The cornea is spherical, or nearly so, and the tubes converge to a common central convex retina upon which are produced not a lot of pictures side by side, but one larger composite picture made by all the images of the same object falling exactly upon each other.

A PHOTOGRAPHER'S OVERHEAD RAILWAY. BY CECIL M. HEPWORTH.

As a general rule, the amateur photographer—with the accent on the amo part of the first word—is nothing if not versatile. We live in an age of specialism, so we are told. Very possibly we do, so far as the professional is concerned, but your real, genuine amateur is no specialist, bless him. He dabbles in every branch of his art; every ramification of his science. He "enthuses" freely at every new departure, and immediately comes and sees, if he does not always conquer.

In the summer he tries his hand and camera at every possible subject, and if he *is* "jack" to all and masters none—well, he gets a mint of pleasure out of it and it's jolly good for trade. And when the winter comes round, with its hopeless light and "impossible" weather—not that the summer has been particularly "possible" this year—he finds himself the possessor of hosts of negatives, good, bad, and indifferent,

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which he must print and reduce and enlarge and make into lantern slides, opalines, frescoes, and many other things for the torment and delight of his friends and acquaintances—not to mention his long-suffering relations.

Now, although our amateur photographer is a man of many parts, it does not always

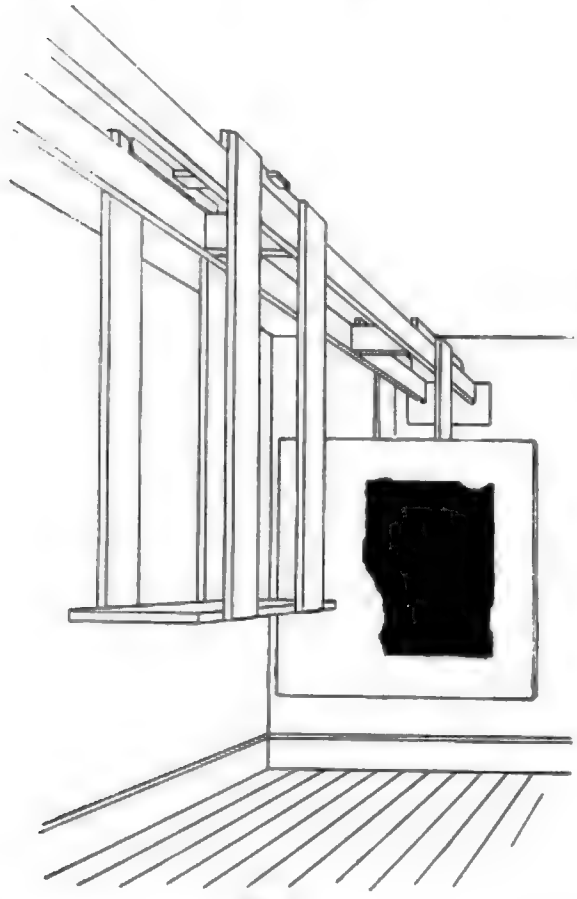


Fig. 1

follow that the number of his apartments is strictly proportionate. Indeed, there is many a man whose photographic soul would gladly free itself from the bondage wherein it finds itself pent with galling fetters, and soar, etc., etc., etc., whose artistic, scientific, and general operations have of necessity to be confined to one room of not altogether unlimited dimensions. A good enlarging apparatus, with its easel, takes up considerable space. A reducing camera does ditto. Likewise an arrangement for copying is not altogether without length, breadth, and thickness, and it takes up room for the same reason that the others do, that it must be fitted with some contrivance whereby the various parts may be maintained with their optical axes strictly in the same straight line, and that line at right angles to the surface of the picture to be copied, or the negative or enlarging paper, as the case may be. A suitable and convenient contrivance which shall combine all these various engines—and more besides—in the one piece of apparatus, taking up but very little room and no floor space, would be a great desideratum—and now I am fairly on my rails, so to speak, I hope to run a bit more smoothly.

The idea of the arrangement which I have introduced into my workshop with considerable success is that of an overhead railway. Two wooden rails about a foot apart run the whole length of the apartment a short distance below the ceiling, and the various pieces of apparatus, the enlarging lantern, the easel on which the bromide paper is pinned, the copying camera, the shelf for holding the book or picture to be copied, the frame carrying the lamps which are required to illuminate the picture, the vignetting screen, etc., etc., each or any of these can be lifted off or attached to the rails very easily and in a very short space of time.

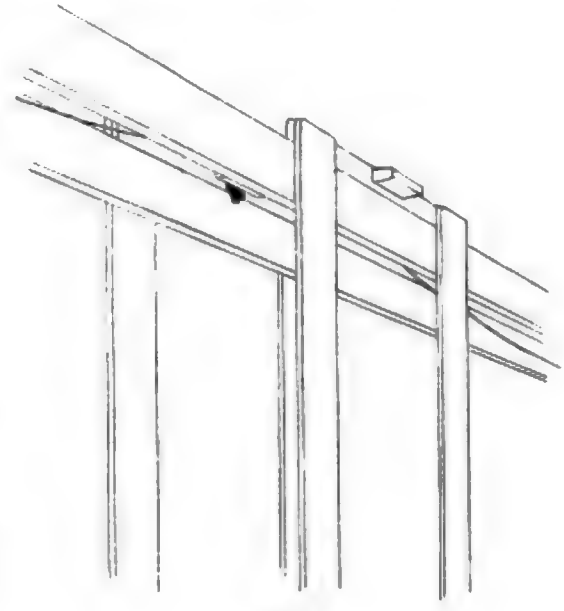


Fig 2

The general principal of the thing can be gathered from the diagram, fig 1, where the two rails are shown running along the whole length of the room a little below the ceiling. These rails are made of pine wood, an inch and a half in diameter, by three inches broad. They are connected together at intervals of

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about three feet by cross pieces or "sleepers" of the same wood, and supported at the ends on stout wooden bushes fastened to the wall. The upper edge of each rail is plentifully besmeared with blacklead in order that the "carriages" may run smoothly upon it without undue friction. If the length of the "permanent way" be so great that there is a liability that the rails would tend to sag in the middle, it might be supported from the ceiling above by means of a strut of wood or other suitable material attached to one of the rafters lying above the plaster, its other end being fastened to the central sleeper. However, in a railway of only moderate length this sagging of the lines should not be of any considerable extent, provided that sufficiently thick wood is used for their construction.

And now we come to a consideration of the carriages. Let us take one of the simplest to begin with; the one shown in the sketch, which takes merely the form of a pendant table, designed for the reception of miscellaneous pieces of apparatus. As will be seen, it consists simply of a piece of board of the same width as the distance between the two outermost edges of the rails above, and hung therefrom at a convenient height; that is to say, just a few inches below the common central line to which all the appliances are adjusted. Each pair of uprights springing from either side of the table is attached to a cross piece at the top which rests upon the upper edge of the rail, and is free to slide thereon in the direction of the length, in order that the distance between one "carriage" and the other can be readily alterable. For greater convenience in modifying the relative position of the various pieces of apparatus, a system of ropes and pulleys—not shown in the sketch—is used in connection with them. To the "rolling" portion of each carriage, so to speak, that is to say, to the upper part where it slides upon the rails, two cords are attached, one in either direction, one of which passes over a pulley-block at the farther end of the apparatus, and returns thence to another pulley at the opposite extremity, while the other cord passes direct to the "home terminus," as it were, where after being passed over its pulley it hangs down, and is attached to the free end of the first cord so as to form an endless band. So that the operator, holding this loop of rope in his hand, has full control over the position of the lantern, or camera or screen, whichever piece of apparatus the particular cord happens to apply to, and can draw it nearer or farther away at will with the greatest ease and comfort.

Every one of the carriages should be provided with this system of cords and pulleys, but as the whole idea of the contrivance is that the various parts shall be readily detachable from the main arrangement so that the same railroad shall serve for a great variety of traffic, to go back to the railway technology, it would not do for these cords to be permanently attached. You see this contrivance is some-

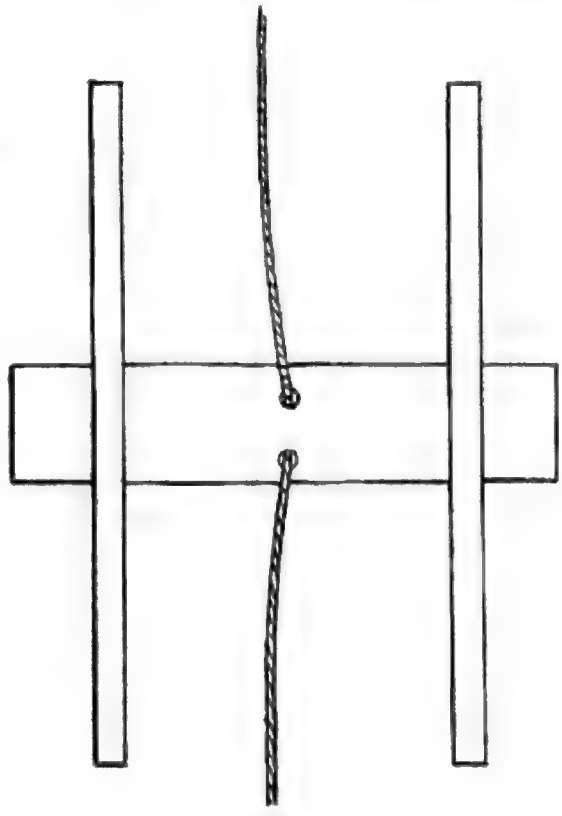


FIG. 3.

thing of the nature of a cable tramway, seeing that the motive power is furnished by traveling ropes, and not by independent motors, and, as in the case of the cable-driven trams, the carriages must not be permanently attached to the cord, but must be provided with a means of clutching it when necessary. In my own practice I have found that the best plan is to employ three sets of ropes, each with its own independent pulley-blocks, for more than three carriages are never required on the lines at the same time. Each set of ropes operates a little trolley which normally runs upon the main lines, but which when it is wanted to work one

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of the carriages rests in slots provided for it in the upper part of that carriage, and draws that up and down instead, at the will of the operator.

In the diagram shown herewith (fig. 1) two carriages are shown in position. One is the simple table already described, the other is a lantern screen. Besides these, others will be necessary, according to the work which is required to be done. These two are sufficient for ordinary simple enlarging, unless it is thought better, as perhaps it is, to employ for the lantern a separate carriage to which it is a fixture. For more elaborate work a third piece carrying the vignetter will be desirable. I do not mean the ordinary, vulgar vignetter used for making those prints or enlargements—generally portraits—in which the "picture" is made to fade away by easy stages towards the edges into the nothingness of a plain white margin. We all know Dr. Emerson's opinion of such productions. I refer to a shading device, which is so useful in shielding and subduing certain portions of the picture to be enlarged, and in the double printing generally necessary where clouds and other external accessories are to be introduced. It is easy to see how greatly the usefulness of this shielding device must be enhanced when it is firmly held in position as in this railway.

To the inside of each of the runners of every carriage a small plate of metal is attached, whose duty it is to prevent them running off the rails. The small plates of brass which are sold for attachment to the backs of picture frames to hang them up by, answer this purpose perfectly. When it is required to detach any carriages from the rails it is only necessary to lift it slightly so that this little metal keeper ceases to engage, when the springiness of the wood will allow of the uprights being separated a little so as to free the rails, and the carriage is liberated, the little trolley carrying the ropes settling down upon the rails ready for attachment to the next car.

In fig. 2 the details of the upper part of one of the carriages are shown. It will be seen that the crossbar of the trolley rests in the two slots provided for that purpose in the upper side of each runner of the carriage. The trolley itself is better shown in fig. 3, from which it will be seen to consist of three pieces of wood arranged in the form of a letter H, the two side pieces being of such a distance apart that they will slide easily between the two rails of the main line, while the cross pieces projects beyond them to a sufficient extent to engage with the slots in the upper part of the carriage, as shown in fig. 2.

Besides the four carriages already mentioned, the lantern-slide maker will require a fifth to hold his special camera for reducing to lantern-slide size from quarter plate or larger negatives; the condenser or sheet of ground glass, with the source or sources of light behind and the negative in front, being placed on the table carriage already described. Then he who aspires to copying by photography will want another carriage to which to screw his camera, while the book or picture or anything else that he wishes to make a copy of will require yet another. Of course all of these need not be made at first. The enthusiastic amateur can confine himself to enlarging, say, to begin with, and construct only the necessary apparatus for that interesting pursuit. Then, later on, when he feels himself called upon to try his hand at one of the other winter pastimes, he can without much trouble construct the necessary carriages in a very short time and go ahead.

Let him be careful, however, in every fresh carriage he makes, that the optical center of the instrument it carries be the same distance below the overhead rails as in every other, so that any two may be taken up with the full assurance that they are in perfect alignment. Then he will reap the full benefit of the contrivance, and, I feel sure—that is to say, I hope—that he will never regret the trouble and time he expended in the construction of this Overhead Railway.—*The Amateur Photographer* (British).

A Vignetter.—How to vignette prints successfully is often a source of trouble to many amateurs. We are not all blessed with plenty of superfluous cash to buy a meat-jack to do the necessary turning of the frames for us. Now the following simple apparatus will answer very well with a minimum amount of attention.

Procure a level board, say 18 inches in diameter; drive three small nails into the side of board and fasten some stout string or wire, about 18 inches long, with one end to the nails, about 12 inches upwards to a wire ring, and tie the ends of the three strings together to form a loop. Then take about 12 feet of thin but strong cord, double it, and tie the ends together to form a loop; suspend this from a branch of a tree or other projection, and attach the board arrangement by means of a nail through the loops. If the frames with the vignetters in position are laid on the board, and the whole put in rotary motion, a first-class vignetter will be the result.—*Photographic News*.

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HYDRANGEA BY M. M. HOPKINS

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER III.

(*Continued from page 96*)

There are, besides, two adjustments, the focal and the axial, the one an adjustment for distant vision, the other for single vision, and connected with these is the adjustment of the pupil, which contracts and expands, not only to light, but also to distance and nearness of the object. Therefore, three adjustments take place when we look at anything. Thus we see our perfect image can only exist in one place at once, that all between the eye and object and beyond the object is indistinct, and that the further off the object is the more luminous does it appear. Two objects, too, may be seen as one. We will now proceed to discuss in detail how this eye effects our perception of objects.

PERSPECTIVE.*

Some years ago Mr. Godal! (a painter) and I made some experiments with the object of comparing a monocular perspective drawing with the drawing of a properly corrected photographic lens. We found that under similar conditions they were alike, as was, of course, *a priori*, probable. Since that I published a short paper with an experiment, which threw grave doubts upon the truth of perspective drawing when compared with what the eyes really see.

We now offer a series of propositions, experiments, proofs and deductions, which we venture to think are of fundamental importance to all artists, as well as to physiologists and psychologists.

Our experiments and deductions will show that for scientific reasons the accepted rules of monocular perspective are likely to mislead the artist, and prove the fallacy of photographic and all mechanical methods of measurement for artists who wish to draw things as they appear.

Proposition A.—The eye does not constitute a symmetrical lens, the† top and bottom portions being different. That portion of the eye which perceives distance and distant objects (*i.e.*, those above the ground), sees the objects on a larger scale than the portion of the eye which views the foreground or nearer objects, therefore our impression of nature is not what we get with a

* When we use the term perspective drawing, we mean a mathematical drawing of various objects in the field of vision (*i.e.*, angular measurements), as received on a glass plate (ordinary perspective drawing) or upon the screen of a camera, for, under like conditions, they are, as is well known, identical.

† We have ignored for the sake of simplicity the optical law of inversion of the image on the retina; when that is considered, the terms "upper" and "lower" must be merely interchanged.

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mathematically correct perspective drawing, or the drawing of an aplanatic photographic lens. That is, a perspective drawing surprises us by making the foreground objects look larger in proportion to the distance. Also we see a larger arc with the lower half of the eye than with the upper.

Proof 1.—That we do not see the same amount with both halves of the eye (upper and lower) is proved by the observer lying on his back and looking straight up at the sky, when he will find that the field of vision of the upper half is much more limited than the space seen by the lower half of the eye. This holds for either one eye alone or for both when used together.

The proof is completed when we stand with our back to the landscape, bend down and look between our legs. Here the fields are inverted, and consequently the distance appears small and far off, and gives much more the appearance of a sharp photographic rendering of the scene. This peculiar effect has long been well known, and it has puzzled a good many observers, but hitherto no valid scientific explanation has been offered.

Proposition B.—We think this may be the result of the naturally selective action of the retinal nerves. It has been to our advantage in the struggle for life to see all the objects near to us and close around clearly, and to compass as wide a field as possible. It has also been to our advantage in the struggle for life for certain parts of nerves to try and draw distant objects nearer and to enlarge them, so that special functions may have developed purely by natural selection.

Deduction 1.—That mathematical perspective drawing gives quite a false impression of what we see when using *either one of our eyes or both*.

That such is actually the case we will now endeavor to prove, at the same time still further supporting our contention that the upper and lower portions of the eye see objects in different perspectives.

Proof 1.—Let the observer select a church tower or tall chimney for experiment. If the sides are parallel the object will *appear* to his eye wider at the top than at the bottom when he stands facing it at the distance of the tower itself and looks steadily at its center. These experiments are best made in the diffused light of evening. The experimenter must not move his eyes up and down the tower from top to bottom, and so *measure or correct* his impressions, but he must look steadily at the center of the tower and take his pure sensuous impressions. As most towers and chimneys do taper considerably the result the observer gets when close to them is that they *look parallel* or nearly so. This fact was, no doubt, felt by the architects of the Parthenon, and it has never been known why they built the columns leaning inwards, a little out of the perpendicular. That they were built out of plumb has been proved by measurement, that they *look* parallel is well known, and the reason of this we venture to find in our proposition.

Proof 2.—A very simple proof is to look about the middle of a doorway or door—it will be felt that the door or doorway is wider at the top than the bottom. The same holds with books in a book-case.

Proof 3.—Cut two slips of paper.

(*a*) 8 inches long by 2 inches wide.

(*b*) 8 inches long by 2 inches by 1⅞ inches wide, so that it tapers ⅛ of an inch.

If the parallel slip (*a*) be held upright 8 inches from the eye (its own length) and looked at straight in the center—the center of the paper being opposite to the eye—the paper will appear slightly wider at the top than at the bottom, the same proviso of not correcting the pure impression by measurement (looking up and down it) holding, as we pointed out in the case of the church tower.

If the observer now takes the tapering slip (*b*) and holds it narrow end upwards, looking at it in the same way, it will *appear* parallel; if he hold it wide end upwards, it will appear much wider at the top than at the bottom.

This holds equally true if the experiments are made either with one eye or both—showing that binocular vision has no effect on the impressions.

Proof 4.—Another interesting experiment is to place a penny upright on a table and a halfpenny 18 inches behind it and a little to the right or left of the penny. The eye must look *over* the penny at the halfpenny, so that the penny is a foreground object and the halfpenny a distant object. If the observer now looks steadily at the halfpenny, at the same time seeing the penny, he will find the impression is that the halfpenny looks nearly as large as the penny.

Proposition A and Proofs deal mainly with what we would describe as *Vertical vision*—that is, with the variations in the appearances of objects when placed one over the other, as in a

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vertical column, or with objects at a distance as compared with objects in the foreground.

But within the radius where binocular vision acts (calculated by Mr. T. R. Dallmeyer to be 60 yards), new and important variations occur. These properties we shall consider under the term of Horizontal vision.

Proposition.—Within the limits where binocular vision is effective (say normal vision, 8 inches, to 60 yards) objects *appear smaller when they are compared with objects beyond the binocular limit*—that is, they appear smaller as compared with drawings as given by monocular or mathematical perspective.

An experiment to practically bring the effect of the binocular vision variations entering into the matter may be made as follows:

Take the tapering slip of paper aforesaid (*b*) and place it between the two eyes, the wide end resting upon the bridge of the nose, the slip being inclined at an angle of 30° with the horizon. The result is that the paper vanishes *towards* the eyes—diametrically an opposite result to what perspective would lead us to expect. This phenomenon still holds if the paper be gradually moved away from the eyes and held at arm's length, but in the same plane.

Proof.—Place a book at a distance of 6 feet from the eyes. Then proceed to measure the width of the book with a pencil (one eye being closed), as a draughtsman draws objects by monocular perspective, and then open the other eye and measure the width of the book with both eyes, the binocular measurement will be found to be smaller than the monocular measurement. If the height of the book be measured in the same way, there will be no difference in the result obtained with one or both eyes.

But more convincing is Proof 2. Wafer a square sheet of white paper (say 8 inches square) on the wall or on a window, 6 feet from the observer, and look at it. The impression given will be that it is larger vertically than it is horizontally. This explains the old trick of marking off the height of a tall hat against a wall, as a rule everybody places the mark too high—the reason is now explained.

Still another proof. Stand a halfpenny and penny on the table, as directed in the previous experiment. Now place the eyes on the same level as the plane of the table and observe. The result will be exactly the reverse to that previously obtained. That is, when looking directly at the halfpenny, at the same time looking (indirectly) at the penny, the penny will appear the larger, and *vice versa* when looking directly at the penny and indirectly at the halfpenny, the halfpenny will appear nearly as large as the penny.

Another everyday proof. Let a person sit in one end of a long punt with parallel sides, and look at the other end—it will look to him to be wider than where he is, and yet its sides will by perspective laws vanish quickly away from him.

These proofs show the effect of binocular vision, which is to increase the appearance of height and to narrow the appearance of breadth, consequently it makes objects appear taller than a perspective drawing would do.

Deduction.—The reason we get a different impression of relative sizes of objects by normal vision from that given by mathematical perspective drawings and photographs, is that the combination of these properties of Vertical and Horizontal visions give quite a different result to that of perspective drawings.

Final. Having shown how we see forms, it only remains to say that a mathematical perspective drawing or the drawing of an aplanatic photographic lens does not give forms as we see them. They are altogether false to the visual impression of the proportions of things and therefore give a wrong idea of the original scene. On the other hand, a perspective drawing or correct photograph gives the *actual facts* scientifically, *i.e.*, the pillars of the temple as leaning, the paper in experiment as *square*. All such drawings are, therefore, purely scientific diagrams, and artists, who wish to render what they see, must not rely upon them.

Aerial perspective is the perspective due to the scattering of light by ærial turbidity, for the atmosphere contains floating particles of matter; as the object recedes the curtain of turbidity becomes thicker and distant dark objects grow dimmer and bluer. This turbidity I believe makes the objects *appear* closer together, just as two dots joined by a line *appear* nearer together. If this be so, there is another reason why in nature objects appear differently to the eye than they would in a photograph, and why sharp, clear, bright scenes in photographs often appear so scattered. Also it is evident if every plane be *sharply focused* dull and bright objects in the middle distance and distance will be brighter or duller than they appear to the eye, which is another reason why some objects should be thrown a little out of focus in a landscape photograph.

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Thus artistic vision depends upon vivid visual impressions, and it is the artist's duty, as M. Helmholtz says, "to find out the more predominant elements and relations of the visual impressions that determine our conception of what is seen." We will briefly analyze them.

Light.

That must be given truthfully first of all. We must be true in tone in our practice before all things. We have spoken of these things elsewhere.

Form.

Since on a plane surface we can only get a faithful perspective view which is stationary, so long as the point of sight (eye) is stationary, it follows an artist can really only get one picture from one point of sight, and directly he alters that point of sight he has a new picture. This causes painters much trouble, but it causes us none, if we work within the legitimate conventional limits of perspective and use our lenses correctly. But it will be said by moving our two eyes we estimate distance and the size of objects, and our eyes give us two pictures appearing as one. True, and herein again is another radical difference between the eye and the lens. We feel the displacement of objects as we approach a picture (less on approaching a *large picture*), and this accounts for the effect of violent perspective, for in small pictures the want of the second representation for the other eye is too marked. Hence, perspective drawings, seen from a point of sight that does not really occur, appear true. Therefore, owing to this imperfect action of binocular vision, there is always an incongruity between the picture and reality, so the painter gives depth by subordinate means—*i.e.*, by the relative focal sharpness of planes, by the direct intelligibility of the work so that it works quickly on the spectator by the true perspective rendering of different objects and their varying sizes, and by truth of tone and modeling, by the focusing of light, and the mutual reflections of surfaces on each other, and ærial perspective and coloring. Of these conditions (some accidental) the true rendering of tone, focus, and ærial perspective, are the most important. And so the painter makes the unity of a picture more favorable than any photographer ever can and gives a much truer impression of a landscape than a camera can.

Contrast.

Another great mental aid to the desired effect is contrast. Brightness appears changed by the proximity of the mass of another tone, so that the original appears darker by approximating a light shade and *vice versa*. Successive contrasts are obtained, as Helmholtz says, by the previously fatigued retina passing over them. Another reason then why the planes should not all be rendered of equal sharpness for then there is a loss of contrast and, therefore, of solidity, and the fatigued retina wants a subdued and delicate distance to dwell upon, and it responds more quickly to that stimulus after looking at the principal object. By careful, artistic focus, this contrast is emphasized. In short the *subjective phenomena must be represented in the picture*, and no photographer can do that. For example, the eye irradiates light owing to the turbidity found in its media, and irradiation sheds its halo uniformly over far and distant objects, the photographic lens does this to a far more limited extent. But we must use our lens and chemicals to render this irradiation. It has been said that if we run our eyes over a landscape, we instantaneously focus the various planes; this is not so if they are any distance from us and any distance apart, for then there is a distinct and appreciable time taken to effect this alteration and physiology clearly explains why this is so. To do this, too, implies taking a new point of sight for every plane; that the eye can do, for it really consists of a *series* of lenses; but the photographer has but *one* lens, and if he wants new points of sight or new pictures, in fact, he has to use his lens afresh. We cannot get beyond our limitations, and even painters are limited here by conventional 'laws'; they may only take one point of sight for one picture, because they, too, are working on a plane surface. As Professor Helmholtz says, complete *apprehension* of external objects by the sense of sight is only possible when we direct our attention to *one part after another* of the field of vision, in the manner I have described—that is, new points of sight must be taken each time, which would necessitate a series of pictures and several lenses for us, a series of pictures for the painter. An art is limited, but pictorial art being a translation on to a plane surface of subjective sensation is limited by the very organs we see with and the conventional laws of perspective that have grown out of them—that is, if we pretend to paint anything as it is seen.

On these data and within these limits, then, must we work, and here we append a few general principles deduced from these data, which must guide us in our work.

(*To be continued.*)

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ON WALLASEA ISLAND

A. HORSLEY HINTON

INTENSIFICATION OF NEGATIVES WITH MERCURY AND FERROUS OXALATE. BY CAPT. W. DE W. ABNEY.

It is almost an impertinence to write on this subject when we have Mr. Chapman Jones to tell us about it, but as he may be shy of patting his children on the back in public, he must not be surprised if some one else pats them for him. His pet intensifier, which he has advocated through thick and thin, is the treatment of a negative with mercuric chloride (bichloride of mercury) till bleached, and a subsequent treatment with ferrous oxalate. The mercuric chloride is used to increase with mercury the volume of the metallic silver. As the writer has narrated in a previous article, the white-looking image is really much denser than it looks, and must by itself be treated with respect. But when the white image produced by the combination of the metallic silver with the mercuric chloride is itself subjected to the reducing action of the ferrous oxalate, we have an image which is in reality an amalgam of mercury and silver. This forms an excessively stable image, and does not appear liable to suffer from atmospheric impurities in the same way as does the deposit formed by the application of cyanide of silver to the bleached image. The application of bromide of mercury formed by adding bromide of potassium to bichloride of mercury, and then a treatment with this cyanide of silver solution, was long a favorite, and gives images of splendid density, but unless jealously protected, in time shows an irridescence on the surface of the film which indicates that a London atmosphere, at all events, is not to be trifled with. When a negative is varnished, the negatives so treated have, however, remained intact, and have kept their color perfectly, though without this protection the numbers that have gone wrong in one's plate boxes are almost as many as have been intensified. Owing to this the cyanide method of intensification, was abandoned, and resort had to the intensification where ferrous oxalate was substituted for the cyanide, and up to the present time there has been no cause of regret in having made the change. Old negatives are like old clothes, they are kept long after they have served their purpose, but, given a lot of mediocre negatives which one is ashamed almost to look at in the first instance, the disease after intensification helps the photographer in sacrificing to the wash-tub what he would otherwise have kept, and for this reason the writer has at all events to be thankful to the cyanide process.

Success in using the mercury and oxalate is not always attained at first, and it is in our recollection that the first negatives we tried to intensify in this manner were rendered useless. Marble stains and all sorts of marking disfigured them, and for some time this process was abandoned, but another trial, and the use of a little common sense (often called a mixture of brains by writers in the photographic press), brought a success which has ever since been

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uniform. The marble-like streaks and stains disappeared, and the surface of the negative was unclouded in any way. The great point to attend to in this process is washing thoroughly at every stage. No mere rinsing from hyposulphite will be effectual; it must be eliminated, as far as washing will eliminate it. When developing negatives on tour one is apt to scamp washing, for so long as the greatest part of the hyposulphite is removed the negative appears all right, any minute crystals which may form on drying being lost amongst the crystals of metallic silver. If such a scantily-washed negative be, however, put at once into the mercury, it may happen that a disaster may occur in the shape of markings. It is always advisable to wash the negative pretty thoroughly before commencing the intensifying operations. In all our principal washing operations we use a tap, and place beneath it an ordinary sloping board. On this board we lay the negatives touching one another end to end. The stream of water will thus pass over each negative. Suppose we are intensifying a dozen negatives—say half-plate—four of these may be placed end to end on the board, and thus four are washed at once. When it is considered the washing is sufficient, the plates are laid in a dish of water and placed one by one in the saturated solution of mercuric chloride, made by simply placing a lot of crystals in water, and allowing as much as possible to dissolve. If a little common salt be added the solution takes place more readily, but without this aid the strength of the solution will be sufficient.



THE HARBOR QUAY BY G. E. MAINWARING

The negative when bleached is placed on the board and close to the stream of water, and the next negative is then bleached and placed below it on the board, and if some half-dozen negatives are bleached, by the time that the last is placed on the board the first one will be washed almost free from the chloride. It is then removed, but it should not be treated at once with the ferrous oxalate, as, if it be, the marble stains will be liable to occur. It should be placed first in a dish of distilled or rain water, or in default of this, in water that has been boiled for a considerable time to precipitate the lime held in solution in it. After staying a minute in this water, it is transferred to another dish of the same water, and left there for a couple of minutes, when it may be placed in the solution of ferrous oxalate. The lime will be so scarce in the film that the oxalate of lime formed will be imperceptible, for it is this compound that gives rise to the stains above alluded to. The ferrous oxalate must be applied till the whole film right through to the surface of the glass becomes a black (perhaps slightly gray) color, when it will be be known that the reduction has taken place. If the negative containing the solution of ferrous oxalate were placed in the running water, the oxalate of lime would equally form, so the main bulk of the solution must be washed off in a dish of distilled or rain water, and the negative be removed to a second dish of the same water. When all the yellow color of the oxalate has been removed it may then be placed under the stream of running water, and no harm will come. It sometimes happens that distilled or rain water is not available, or even boiled water. In a case such as this the negative may be placed in the ferrous oxalate after the wash (subsequent to bleaching) under the tap, and the reduction of the white compound completed. It must then be placed in water very slightly acidified with acetic or hydrochloric acid, which will decompose the oxalate and leave a soluble compound. A couple of baths of this must be employed, and it may then be

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washed under the tap. When hydrochloric acid is employed the color of the image is grayer, due, doubtless, to some slight action on the metallic compound forming the image. This plan is, therefore, not recommended except in an emergency. It is wonderful how little distilled water need be used in these washings. Enough to cover the plate is sufficient if three dishes containing it are used, and several negatives may be passed through the same water without fear. After that, as the gunners say, No. 2 becomes No. 1, and 3 becomes 2, and a fresh supply is given to No. 1 dish, which then becomes No. 3. Distilled water is cheap, and no great expense will be incurred in providing it: a negative that is worth intensifying is worth the cost of the water used. It might be thought that, instead of using ferrous oxalate, any developer might be employed. There is no doubt that amidol or metol or pyrogallic acid will give a black image, but here one is met with the fact that we are using sulphite in the first two cases, which, as is well known, gives a black image, and in the other ammonia, perhaps, which also gives a jet black but unstable image. We cannot, therefore, be certain that we are obtaining a true metallic image such as we obtain when we are using ferrous oxalate. With this latter salt it is as well to add a trace of oxalic acid to ensure neutrality of the mixture, and thus do away with any risk of alkalinity. Mr. Chapman Jones has pointed out that this process gives no finality to intensification. If the first application does not give sufficient opacity in the high lights, it can be secured by repeating the process a second or a third time. With the cyanide process the greatest intensity is given at the first application, and the opacity may be reduced by immersion in a one per cent. solution of hyposulphite. This is very convenient, since the opacity may be stopped at any required degree. With the ferrous oxalate process, on the other hand, the opacity increases step by step, and no intermediate opacity can be placed upon the image. It is true that one may only half bleach the negative and reduce the amount bleached to the metallic state, but it is rather a dangerous plan, since the permeability of the gelatine film is bound to vary at different parts, and one may obtain an image which is anything but that one may wish to obtain. It is well to be content with the opacities that may be given by a thorough bleaching. The action of this intensifier has been admirably worked out by Mr. Chapman Jones, and any reader who is curious to know the chemical reactions that take place, should refer to his paper read before the Photographic Society. The information there given is not only accurate but full. There are some interesting experiments that can be carried out with this intensified image. They are not only interesting, but may be of practical use. It is, however, inexpedient at the fag end of an article to do more than remind our readers that such is the case, and we propose to revert to this in a subsequent communication. —*Photography*.

PHOTOGRAPHY IN COLORS. BY ROMYN HITCHCOCK.

In the *Journal of the Society of Arts* last month there was published an announcement by Sir H. Trueman Wood, the Secretary of the Society, of the discovery of a new process of photographing in colors, of a most surprising and remarkable character. In the number of *Nature* dated February 4th, this article was reprinted, together with a communication from Capt. Abney, upon the same subject. The process was suggested by Dr. Adrian Dansac, and practically applied by M. Villedieu-Chassagne, of Paris, by whom it was made the subject of a demonstration at King's College, London, in the presence of Sir Trueman Wood, Capt. Abney, Prof. J. M. Thompson, and Mr. Herbert Jackson. I presume that the published articles will have been reprinted in the photographic journals at home before this communication is received by the Editor, but the subject is of such great importance and interest, that I may venture to risk some repetition of what has perhaps already been presented to the readers of this journal.

Through the courtesy of Sir Trueman Wood and Professor Thompson, I have been favored with an opportunity to examine some of the colored prints prepared by this process, and I was agreeably surprised at the excellence of the results. It is true, the colors are not quite perfect, and there is something to be desired in the direction of brilliancy and transparency, the general effect being very much the same as that of a print colored by hand with aniline dyes. Nevertheless, I am inclined to believe, that the process is capable of great improvement, and that it is destined to find extensive application in many directions.

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It appears that the negatives are made on ordinary gelatine plates, which have been specially prepared by treatment with a solution, the composition of which is not disclosed, and fixed in the ordinary manner. A negative thus made does not differ in appearance from those with which we are familiar. There is no trace of color to be observed by looking at it by reflected or transmitted light. Nevertheless, the negative possesses remarkable optical properties, for when a print is made, upon a gelatine plate or silver paper, which has also been treated with the same solution, the positive exercises a selective absorptive action for certain colors, which are successively applied in solution. In carrying out the process, the prepared and printed plate or paper is first treated with a solution, which Capt. Abney refers to as "a mordant in the shape of a colorless liquid containing, I should say, albumen and salt."* This is brushed copiously over the face of the print, after which the blue, green, and red solutions are applied in succession. These operations are conducted in "good daylight," which is said to be necessary, although as to this point I am somewhat in doubt, for I have no recollection of a single day, during the past three weeks, in London, when there has been even one hour of good daylight, as we understand the term at home. However, we can make allowances for differences in climate, and assume that some daylight is necessary, such as can make its way through the mists and fog of London in winter.

As these solutions are successively applied the colors are taken up by the print, the blues in the subject coming out blue in the print, the greens green, the reds red, and by the combination of these colors all the intermediate hues and shades are produced. Thus the monochrome print becomes a picture in color.

I am told by Prof. Thompson, that the selection of color is quite independent of the order in which the colors are applied, and that the three colors may even be applied in mixed solution with the same result.

It is necessary to clearly understand the difference between this process and other methods of color photography in which the colors are actually produced by the action of light, as in the admirable process of Lippmann. In the Lippmann process the colors are actually produced by the interference of light vibrations, determined by the physical constitution of the film in which the colors are made visible. There is a definite arrangement of material particles, molecular aggregations of reduced silver, induced directly by the action of light, and retained through the operations of developing and fixing. The theory of this process is capable of mathematical demonstration and is not difficult to explain.

In the new process, however, we are met with a much more complex problem. Colors are not actually produced by the light, but the light acts upon the sensitive negative plate and confers upon it a most remarkable and mysterious character, whereby the finished negative, without manifesting any visible effect of color absorption upon transmitted light, nevertheless does have some unknown effect upon that light, conferring upon the print a peculiar power of selectively absorbing coloring matters, in a manner corresponding to the colors of the original object from which the negative was taken. The process is, therefore, not one of the production of color, but of the selective absorbtion of coloring matters.

The subject is further complicated by the fact that we are yet unable to understand why one coloring liquid should be blue, another red, etc., or to connect color with physical or other properties of matter generally.

It is premature to speculate confidently as to the physical phenomena involved in this remarkable process. We are still too much in the dark as to the molecular conditions which are productive of color effects, and the process whereby such conditions are brought about by the action of light upon molecular aggregations. It is safe to assume, however, that some such action does take place in the negative as well as in the print, in the process under consideration. We may assume, that a molecular synchronism for the different color vibrations is somehow established in the sensitive film, which is retained after development and fixing. But such a synchronism would naturally result, one would suppose, in a colored negative, which is not the effect in practice. Herein is the puzzle, for this negative, without a vestige of color, acts as a light-filter with such remarkable perfection that the transmitted light possesses distinctive color activities, corresponding to and determined by the colors of the original object! One may well ask: Are these things possible? Is this science, or is the whole thing a nicely devised hoax upon the scientific and

* As regards the use of a special solution referred to by Capt. Abney as a "mordant" both Prof. Thompson and Sir Trueman Wood are under the impression that there is here an error of observation, for neither of these gentlemen noticed the use of any solution other than the one applied in the original preparation of the plates.

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"ETUDE EMPIRE"

BY C. PUYO

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photographic world? For myself, I can freely say, that the result are so incredible, so entirely beyond and outside of anything that one would anticipate, that only the testimony of such eminent gentlemen as I have named led me to give credence to the first announcements of this discovery.

It is obvious that the uncolored negative does exercise this remarkable power of selective action upon the light used in printing. Presumably the negative would also manifest the same or a similar action toward coloring matters as the print made from it, but whether the selection of the colors would be true to nature or in some different order, we are not informed. However this may be, we must recognize that there is a selective light action of some kind in the negative and if we attribute the selective absorption of color in the print to the condition of the reduced silver compound in the picture, we may quite as readily infer that it is the silver in the negative that acts with selective absorption upon the light passing throught it. Capt. Abney seems to hold the opinion that the silver in the image plays an important role in the phenomenon. He says: "It appears as if the image took up selectively these three colors." From the context Capt. Abney evidently means that it is the silver image that takes up the colors in this way. Sir Trueman Wood is obviously of the same opinion, for he says: "How it is that this power of selective absorption is given to the components of the photographic image (principally, of course, metallic silver), is, it appears to me, the interesting question connected with the process."

Assuming, for the moment, that there is established a kind of synchronism in the negative, such as we have vaguely indicated, it is difficult to reconcile this suggestion with the assumption made by Captain Abney and Sir Trueman Wood, that the silver image takes part in the phenomenon, for the molecular condition of the silver compound produced by the action of light, is quite different, both chemically and physically, from the resulting component in the developed image, and presumably, the vibration periods would also differ for the two compounds. For these reasons, it seems to me quite doubtful if the silver compound is an essential factor in the action, and one may reasonably anticipate that the same color effects will be produced without the presence of silver salts.

According to my judgment, based upon the finished prints in the possession of Sir Trueman Wood, but without having an opportunity to compare them with the original subjects, the one color which seems to be conspicuously weak is the red. The reason for this may be in the comparative insensitiveness of the plates to red vibrations, and one may anticipate, that by the use of plates specially sensitized for the red light the brilliancy of that color in the prints will be materially increased. In a similar manner it may be possible to improve the greens. This may have been done already, but we know so little of what the inventor has done that one may be pardoned for suggestions which have already received attention.

The practical applications of such a process will be very numerous and important. It is to be presumed that considerable improvements will still be made in it, but even as the process stands now, if the samples which I have seen are a fair indication of what can be done, it possesses already great value for many purposes. In gallery work it will certainly become very popular, and landscapes with color are far more interesting than when the green foliage is only a mass of black But I was particularly impressed with the very great value of this process of color differentiation for certain purely scientific applications. For example, take the one subject of photographic representations of rock formations for geological purposes. If the colors of the different strata could be brought out with reasonable accuracy, the interest of the photographs would be greatly enhanced.

I have already written considerably more than is quite justified by the imperfect knowledge I possess of the process, but it is on the assumption that there is a widespread interest in the matter, and with considerable faith in the future developments and important applications thereof.

Notes on Dark Slides.—Great inconvenience is often caused by having to take out a note-book after every exposure to mark the particulars.

The following method of marking the slides themselves has proved very useful

Make a solution or emulsion of

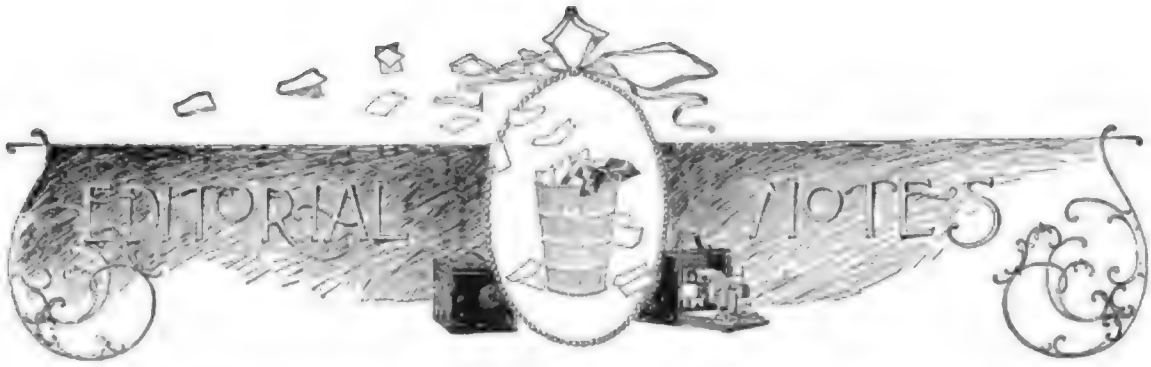
Gelatine	180 grains.
Kaolin	30 "
Bichromate of potash	10 "
Water	1 ounce.

Coat ordinary writing-paper, previously damped in water, with this, and when dry cut into slips the length, or half the length, of the slide and paste a piece on each side.

These slips can be written on with lead pencil and rubbed off as often as required.

It is as well to attach the pencil to some part of the camera. C. J. M. in *The Photographic News*.

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We have had prepared for us a very attractive poster in seven colors. We give a half-tone reproduction of it herewith. Photographic dealers and newsagents will find this a valuable aid in obtaining subscriptions for this magazine. We will send one free on application and a promise that the same will be prominently displayed. The size of the poster is about 2 x 3 feet.

* * * * *

According to a contemporary, one of the Parisian lunatic asylums contains a picture gallery in which is hung the work of the inmates in various stages of lunacy. Does this explain where many of the modern posters come from?

It wouldn't be a bad idea to supply each inmate with a camera and materials. Some of them might even improve on many of the atrocities which are exhibited as artistic studies.

* * * * *

We should feel obliged if the editor of the *Revue Suisse de Photographie* would kindly notify us in advance the next time his magazine contains pictures of dead persons. We can understand the utility of Dr. H. J. Gorse's article on the subject of photography and jurisprudence, but we fail to see the necessity of illustrating it with pictures of mutilated corpses. We have not yet recovered from the effects.

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According to one of the dailies, Prof. Harold Jacoby of Columbia University is enthusiastic in the development of the photographic telescope. While he was in Europe there were made specially for him, at Helsingfors, Finland, a number of photographs of the stars surrounding the pole of the heavens. The new photographic telescope in Finland is not only without a superior, but is situated the farthest north of any in the world that are at all comparable with it in quality. The elevation at Helsingfors and the clear atmosphere make that the ideal place for an observatory, and the instrument there has already added a large quota to the scientific pabulum of the day. The negatives which Prof. Jacoby has secured were exposed according to a new plan, devised for the purpose of determining the most important fundamental constants of stellar astronomy. The plates were made with a fixed telescope pointed



OUR POSTER

exactly at the pole. Very short exposures were made every half hour during fourteen and a half consecutive hours. Each star gives, therefore, a series of twenty-nine images, which lie on the arc of a circle. The common center of all these circular arcs can be fixed by measurement, and will give the position of the pole with respect to the surrounding stars.

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When the position of the pole has been fixed, the astronomical constants can be determined by methods known to astronomers. No other method in use has accomplished this with a precision approximating that attained under the new process. Hence the value of it and the keen interest felt by astronomers and scientists generally.

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THE February issue of *The Practical Photographer* contains, among other interesting articles, an interview with Mr. Bernard Alfieri, one of England's foremost photographers. Many beautiful specimens of Mr. Alfieri's work have appeared in these pages, and we hope to give many more in the near future.

"Nearly all my early and best work," Mr. Alfieri pointed out, "was done on about four



BERNARD ALFIERI

square miles of flat swampy land, called Tilbury marshes. I selected this district because I thought it presented many difficulties, to overcome which would bring me a stock of experience. A man might produce pictures in Derbyshire, North Wales, or any of the ordinary resorts, I judged, without much expenditure of ability, but it would need a special effort to do anything praiseworthy in such unpromising country as this."

"I was encouraged to take up photography even more strongly," he continued, by meeting



MISS COQUETTE BY BERNARD ALFIERI

Horsley Hinton, who was then editing the *Photographic Art Journal*. Some of my work was reproduced in that now defunct magazine At Hinton's instigation I undertook the book which subsequently appeared under the title of "Half Holidays with the Camera around London," and in connection with which I extended my field of work to many other districts. Some of these places have in consequence become so popular among amateur photographers that when I recently spent a few days at Dedham, I found the landlord of the inn unwilling to charge me anything, he told me he owed so many customers to the influence of my little book."

To read the little book referred to, gives rise to the hope that its author will ere long put his pen to paper once again. It proves him to be a keen observer of nature, to be the possessor of a poetic mind, and a happy manner of ex-

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pression as the brief extract which follows will confirm :

"As the afternoon wore on I found myself sitting on a gate—an old friend of many seasons—such a gate as Richard Jefferies would have loved to sit upon reflective. One cannot help thinking what a good photographer he would have made. A lover of nature in all her moods, his observation let no detail escape him ; it is true he stopped down every picture in his mind's eye to focus 32, and yet he belonged to the naturalistic school, if any man can claim a place in it, an exponent of it whom no out-door photographer should feel ashamed to follow.

"The late afternoon wears on, and a gentle breeze has sprung up, clearing away the thick mistiness with a suddenness that is incredible as it is refreshing. The sough in the trees might be mistaken for the sound of the sea with its regular rise and fall, the tall reeds that border the dyke shiver in it after the overpowering burden and heat of the day. Up the gravel bank at the other side of the lane, the convolvulus has forced its way through briar and blackberry, striving with the woodbine's last flower to reach the higher life, the hemlock at its foot has lost its whiteness, the bracken its garish green, and one, involuntarily enough, perhaps, contrasts the crudities of early summer, with the mellow toning down of glorious September."

From the country around the metropolis, Mr. Alfieri, next turned his attention to the Norfolk Broads. They were difficult of access for a man who had only Saturday afternoon and Sunday at his disposal. Half a day was consumed in reaching the ground, leaving only one day for actual work. But *on ne fait pas d'omellettes sans casser d'oeufs*, as the French say, and to Norfolk the enthusiastic photographer wended his way, week after week, winter and summer alike, whether wet or fine, with a devotion worthy of Robert Dick. Often he walked about all day and took nothing, because those elements which make up a picture refused to arrange themselves properly before the artist's eye.

"I could have made lots of sweetly pretty things," explained Alfieri, "the sort of pictures which are here to-day and forgotten to-morrow, but nothing impressive, nothing which would live in memory like such pictures as Davison's 'Onion Field,' his 'Windy Corner' or his 'Salting.'"

"There are pictures," said he in continuation, "which once seen can never be forgotten, there are dozens of pretty bits which leave no lasting impression in the mind."

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Mr. Edward Bierstadt writes us as follows :—"In your issue for February, I find myself quoted as having assisted in testing the relative merits of the various orthochromatic dry plates. This is entirely without authority, as I particularly requested that my name should *not* be used in the experiments.

All that I had to do in the matter was to write what was dictated to me on each plate as it was handed to me in the dark room.

No plates were exposed or developed in my presence at all."

We regret very much that our contributor Mr. Stephen Horgan should have caused Mr. Bierstadt any annoyance, but feel sure that the publication of his name was due to a misunderstanding.

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"Yachtsman" writes :—"Perhaps it would interest some of your constant readers as well as myself to learn whether it is practicable to make use of pure ocean water for washing the fixed plates in case one has only a limited supply of fresh water for that purpose. If you will kindly say a few words on the subject you will greatly oblige."

There is no reason why pure ocean water should not be employed for washing plates. Of course it would be necessary to give a final rinse in fresh water to eliminate the salt which if left in the film would eventually crystalize out and cause trouble. In fact as pointed out by Dr. Jas. H. Stebbins, Jr., the well-known analytical chemist, salt water would act as a hypo eliminator and would not be a bad thing to employ, provided of course that it was used as stated.

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There appears to be no end to the number of projecting apparatus that are being placed on the market. Here is a list of a few which are already being exhibited at the various music halls and places of public entertainment.

The Motorgraph,	The Veriscope,
The Animatoscope,	The Animatograph,
The Theatrograph,	The Vivoscope,
The Kinematograph,	The Eidoloscope,
The Projectoscope,	The Cinagraphoscope,
The Cinmetoscope,	The Biograph,
The Vitascope,	The Rayoscope,
The Cinematograph,	The Magniscope.

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Is it possible that the dream of every photographer is about to be realized and photography in colors become a fad? On another page will be found an interesting article by Sir Henry Trueman Wood on a new process by M. Chassagne.

Capt. W. de W. Abney, writing to *Nature* on the subject, says:

"THE process of color photography, which I had the pleasure of seeing demonstrated at King's College some ten days ago, through the kindness of Sir H. T. Wood, is a very remarkable one. I went as a skeptic. The process may be described in a very few lines. In the first place a negative is taken on a gelatine plate, which has been specially prepared. The plate is developed and fixed in the ordinary way, and the image appears of the same character as if taken on a good density-giving plate. A transparency (a positive) is next taken on a similar plate from this negative, or a silver print made on specially prepared albumenized paper, on either of which the color process is worked. The coloring is of a very simple nature. There are three dyes—a crimson-red, a grass-green, and a very good blue, all in solution, and mixed with some other ingredients besides water. There is also what we may call a mordant in the shape of a colorless liquid containing, I should say, albumen and salt.

This last liquid is brushed copiously over the face of the positive (or the silver print) and the blue dye applied a little at a time. If the light be good (and it was stated that the coloring must take place in good daylight), the blue dye rapidly takes hold of those portions of the surface which represent in monochrome what are blues in the original. For instance, a china vase will take the blue tint, and the face or hands a faint amount of the same color. The green dye is applied in the same manner, and the greens in the original make their appearance in the positive, and so with the red. Finally the print or positive presents a picture in colors, underlying which is the dark brown silver image. It appears as if the image took up selectively these three colors; but why it takes them up it is hard to see. I have by me a portrait done in the manner described, and the negative has evidently been retouched with the pencil. It is difficult to understand why a pencil mark should be the cause of selective absorption of the colors, or that a special plate should be necessary. That the success of the process does not depend upon the inventor's manipulation is quite evident, for negatives were taken by Sir H. T. Wood, quite independently of him, but, of course, on prepared plates given him for the purpose, and from these he made positives. These last, when treated with the coloring matter, gave the correct colors of the original. Still I am somewhat skeptical—I believe it is my failing to be so—and I shall not be satisfied till I get the plates that have been promised me by the inventor (M. Chassagne), and taken negatives of certain test objects which will be unknown to the inventor. If he can reproduce their colors, it will have to be without any reference to the amounts of silver which ordinarily indicate the color in the original, for in the negatives sent every color will be represented by approximately an equal density. Some few years ago a powder process was seen by Mr. C. V. Boys, in which three colored powders selectively adhered to the surface of the paper. The paper was prepared with some glutinous substance and bichromate of potash, and which remained more or less tacky, according to the amount of exposure to light it received. These three powders, a red, a green, and a blue, I believe, if applied in a certain order, adhered to the print, and gave approximately correct results of color, though no special negative was required. Whether this new process now described depends on any similar grounds, it is hard to say at present.

The point that strikes me in the latest process is that it is only from a specially prepared negative that a print suitable for coloring can be made. Were it the negative which took up the color, one might understand the matter better. To me at present the process as stated is a mystery; but, if it does all that is claimed for it, it must be a great success, and the theory of it will have to be investigated in a thoroughly scientific manner. At present the details are a secret; but I am given to understand that the seal of secrecy will be withdrawn before long, as a patent is applied for. We shall then be able to ascertain on what principles the process is worked."

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MR. William George Oppenheim has been playing a practical joke on the editors of some of our papers and magazines. Some months ago we received from that gentleman a photograph entitled "Sunset on Casco Bay, Me.," with a sun nearly half the diameter of the picture or about a hundred times its natural size. It was

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not difficult to see that the "sun" was an effect produced by a secondary image of the lens stop. We returned the picture, but nothing daunted Mr. Oppenheim appears to have sent a copy to the editor of every magazine in the world. We were not surprised at the editors of the *Sun* and such non-technical magazines being taken in, but we are a little astonished at our old friend, Dr. Nicoll, the editor of the *Amateur Photographer*, allowing himself to be deceived.

The picture has, of course, been severely criticised, and Mr. Oppenheim attempts to defend his position in a letter written to the *L. A. W. Bulletin*. This is the most amusing letter we have read for some time, and we only trust for the sake of his clients that Mr. Oppenheim's knowledge of the law is greater than his knowledge of astronomy and optics. For instance, he makes the ridiculous statement that to obtain an image of the sun 2½ in diameter would require a camera capable of being racked out *a quarter of a mile*. The letter is amusing enough throughout, especially the last sentence which possibly explains all—"copies of the picture can be obtained from * * * etc." "Ask your dealer for it, and see you get the genuine" might have been added.

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Prof. Geo. M. Searle writes us as follows: "Having seen, a short time previously, an account of Prof. McKissick's experiments, described in the last number of the Times, I had thought it worth while to try them, and am inclined to think that there may be a mistake in ascribing the results obtained to the action of light. I had found previously to this that it was quite possible to produce effects on a sensitive plate by placing objects *in contact* with it, and then exposing the plate in the holder simply to heat. I had got impressions in this way by a night's exposure in front of a furnace door, the heat being moderate, not enough to warp, or in any way injure the holder; and probably the same effect would be produced by long enough *contact* with the film, by many apparently chemically inert substances at ordinary temperatures.

"To give a fair test to this particular matter, I exposed some white granulated sugar for two days to strong sunlight in a small glass tumbler; then laid a piece of wood about an inch thick on the tumbler, the wood having a hole in it somewhat smaller than the top of the tumbler. Across this hole a flat key was laid. Above the key, as near as possible without touching, was laid an X-ray Carbutt plate in its envelope, resting on supports outside the tumbler. The distance from the plate to the surface of the sugar, which had not been disturbed during or since its exposure to light, was about two inches.

"Apparently under these circumstances if the sugar were emitting rays sufficient to produce a photographic effect, some such effect would be obtained after 48 hours' exposure, which was given in the dark room. But after a strong and prolonged development, no image whatever was discernible. To be sure that the developer was active, it was applied to an old plate, which had been momentarily exposed to light; the plate was immediately darkened.

"I should be glad to learn if Prof. McKissick has been able to obtain 'shadowgraphs' of objects *not in contact* with the plate by means of the rays emanating from sugar."

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In our mention last month of the decision against the Eastman Kodak Company, we failed to mention that it was in their suit against Getz and Hoover, who were doing business under the name of the Buffalo Argentic Paper Company, when the suit was brought. Subsequently Messrs. E. and H. T. Anthony and Company acquired an interest in this company, after which they directed the defense of the suit against the Eastman Kodak Company, with the result as before stated, namely: the judge handing down a decision denying the application of the Eastman Kodak Company.

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The annual report of the Smithsonian Institution contain many articles of interest to photographers. M. E. J. Marey describes the work of the physiological station at Paris, the article being illustrated with a number of chronophotographs. Prof. Janssen gives an account of his system of photographic photometry, and the experiments of Prof. A. M. Worthington with the photograph of the splash of a drop, are fully described, the article being illustrated with several hundred illustrations.

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The next issue of this magazine will contain a well written article on "The Photography of the Nude," by Mr. Gleeson White, late editor of *The Studio*. The article will be fully illustrated with nude studies of the leading photographers of the world.

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The Demeny Chronophotographic Projection Apparatus.*—Apropos of chronophotography, we have already had occasion to speak several times of the labors of Mr. G. Demeny, assistant to Dr. Marey at the Laboratory of Physiology. As long ago as 1891 we saw at Mr. Demeny's some projections of figures simulating the motions of animal life and that were obtained by means of an apparatus that we have already described.

Strips of sensitized film from 60 to 90 feet in length were not in existence at that epoch, and, in order to make a projection of some little duration, it was necessary to employ some makeshift. The images taken by the chronophotographic apparatus upon a strip 4 or 5 yards in length, were printed as positives upon a glass disc sensitized with chloride of silver, and it was by means of this disc that the projection was made. The number of images was necessarily limited, and, since the diameter of the disc could not practically exceed 20 inches, about forty or fifty images were printed upon its circumference, according to the subject.

It was necessary, besides, that the motion represented should form a complete cycle, capable of beginning again indefinitely. In certain cases, for the study of jumping, racing, dancing, fencing, play of the features, and a host of other motions, this apparatus is quite adequate, and will still be able to render great services. But the advent of the long strips of sensitized film that are now manufactured has induced the inventor to so modify the apparatus as to render it reversible, that is to say, adapted for the taking of images in long series and for projecting them. He has preserved the principle of the eccentric, but has placed the latter exterior to the bobbin, in the circuit of the film. Moreover, he has added a toothed roller designed for obtaining a perfect register of the images, the film, to this effect, being perforated at the edges. We believe that it was Mr. Reynaud who was the first to apply this system of registering. This he did in his very ingenious optical theatre, which gave the illusion of motion in scenes of long duration obtained through successive images projected upon a screen; but photography did not avail him, and he preferred to draw, with his own hand, the series of images that he needed for the pantomimes that he composed.

Mr. Demeny's new apparatus employs strips of any length whatever, but up to the present, the longest that have been used are 115 feet. This gives about a thousand images of the dimensions adopted by the inventor, say 1⅝ x 1¼ inches. This wide surface of the images has an immense advantage from the view point of projection since, with the electric light, it permits of making enlargements that may reach sixteen feet in height. If one be content with a screen of ordinary dimensions, the oxyhydrogen light will suffice, and the apparatus be easy to install anywhere. We represent herewith a complete installation for operating in a house in which there is neither gas nor electricity (fig 1, No 1). The cylinder of oxygen, T, is placed under the table and connected by a rubber tube with the etheric blowpipe, L, placed in the lantern. The latter is provided with the ordinary lens, called a condenser, in front of which is placed a small reservoir of water, N, designed for absorbing a portion of the calorific rays so that they may not too greatly heat the film, which, it must not be forgotten, is of celluloid, a very inflammable material.

At the other extremity of the table stands the chronophotographic projector, which carries the film wound around its bobbins. The lantern is so regulated that the luminous rays shall fall exactly upon the aperture that the image passes, behind the objective, O. After the focusing has been effected, all that is to be done is to turn the winch, M. At P and P are seen guides that serve to put the films that have just passed in their normal direction. It is, in fact, the last image projected that is the first to present itself upon the bobbin that has served for the winding during the projection, and were it utilized thus for another exhibition, the scene represented would pass the wrong way. It is necessary, moreover, to take precautions against the images

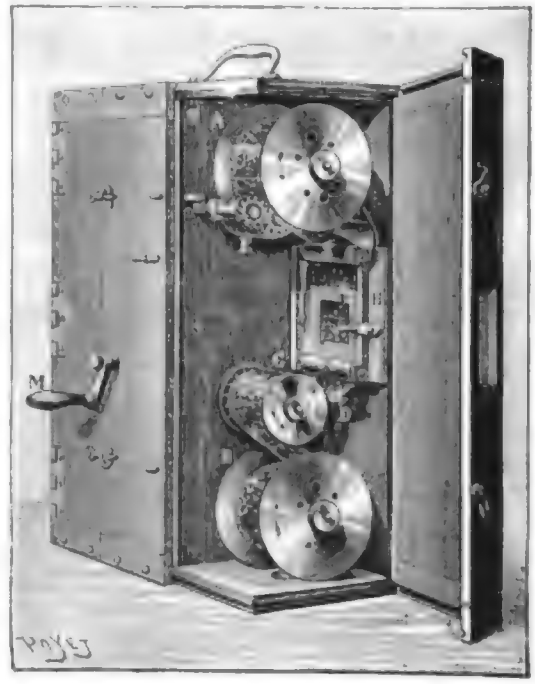


FIG. 2.—INTERIOR VIEW OF THE FILM-WORKING MECHANISM.

presenting themselves upside-down; so the guides are indispensible accessories during an exhibition, and this is why the inventor has judged it proper to fix them upon the table.

As well known, the principle of all projection apparatus of this kind consists in arresting the film for an instant at the moment at which it is uncovered by the shutter. The process employed to this effect by Mr. Demeny is very simple, and has the advantage of not damaging the film, which may thus be used for a very long time. It is shown in the diagram figured herewith (No. 2, fig. 1). Upon coming from the bobbin, the film passes over a guide, S, and then over a rod, D, mounted eccentrically. Thence it goes to the toothed roller, C, designed for registering the images, and then reaches the magazine, B. The mechanism is entirely

* We are indebted to the *Scientific American* for the use of the cuts and the translation of this interesting article, taken from the *Scientific American Supplement*. Attention is also called on another page to the address where these novel machines can be obtained—Ed.

inclosed in a box (fig. 2) and the shutter disc (not represented) is situated on the other side of the aperture, F. Beneath the bobbin, A, there is a rubber roller, E, mounted upon a spring in such a way that it shall bear against the film, whatever be the thickness of the winding upon the bobbin. It is this roller, E, that, moved by a gear of toothed wheels, causes the film to unwind in a continuous manner, and thus prepares work for the eccentric rod, D. The latter, therefore, pulls upon a portion of the film already unwound, but does not strain it. The film, passing under the guide, S, passes between two velvet-lined frames H and T, that are provided with an aperture, F. It is upon making its exit thence and passing over the guide, S', that the film is taken by the rod, D, then runs over the toothed roller, C, and finally over the bobbin, B. All these parts, inclusive of the shutter, are interdependent, and are connected by gear wheels set in motion by the winch, M. None of them has a jerky motion, and no mass in motion comes to a standstill. All the parts of the mechanism have uniform rotary motions, and the stoppage of the film is prepared for by a graduated diminution of the velocity; and so, too, the starting is effected without any abruptness.

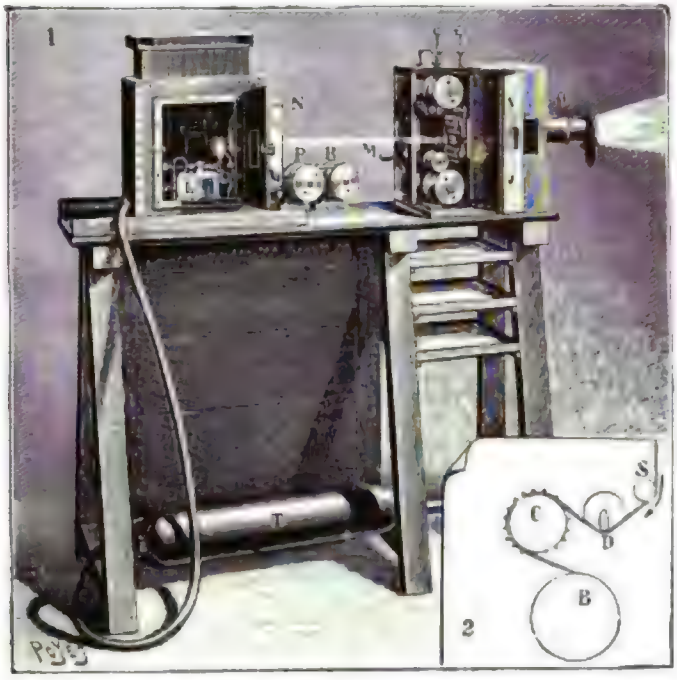


FIG. 1.—ARRANGEMENT OF APPARATUS FOR PROJECTION WITH LIME LIGHT.
FIG. 2.—DETAIL OF DEVICE FOR OPERATING THE FILM.

One of the great advantages of this apparatus is that it permits of utilizing for a very long time such positive films as have not much commercial value. In fig. 3 we reproduce a few images of a strip made especially for the new spectacular drama at the Chatelet Theatre. This strip is 115 feet in length and embraces a thousand images, each of which is colored by hand. It produces a very beautiful effect. The



FIG. 3.—CHRONO PHOTOGRAPHS. ACTUAL SIZE OF FIGURES ON STRIP 115 FEET IN LENGTH.

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negative was obtained with the same apparatus. It sufficed to change the object, and place a sensitized film upon the bobbin, A. The developing is effected much more easily than might be thought. It is the printing of the positive that presents the greatest difficulty, because the negative shrinks slightly in drying, and it is necessary to see that, despite this, every image transferred to the positive strip shall, at the time of the projection, pass exactly at the same place where the negative was obtained. A special machine for insensibly rectifying the position of the images had, therefore, to be devised for the printing of the positives.

All apparatus that are pretty well conceived, as regards mechanism, and pretty well constructed, may give good results; but, among these patented the last year, few operate properly, and this is due especially (aside from their construction, which is not always faultless), to the very principle of stoppage. Herein lies the whole secret of such apparatus as operate well, and it is to these that is reserved, in the future, the exploitation of projections of figures in animate motion. —*La Nature.*

PHOTOGRAPHY IN COLORS.

H. TRUEMAN WOOD.

[*Journal of the Society of Arts.*]

I AM anxious to make, through the medium of the Society of Arts *Journal*, at all events a preliminary announcement of a very remarkable process for producing photographs in colors which was brought to my notice the other day. To say that it enables photographs to be produced in natural colors would not, perhaps, be precisely true, since coloring media are employed; but the result of the process is a photograph in the colors of nature—a faithful reproduction in color of the object photographed—and so, for all practical purposes, it may be said that the long-sought object of photographic research, photography in color, has actually been obtained.

The inventor is Mons. Villedieu Chassagne, of Paris, who has developed a process originally suggested by Dr. Adrian Dansac. The following is his method: (It must be premised that he keeps secret, at all events for the present, the nature or the four solutions he employs.) A negative is taken on a gelatine plate prepared by treatment with one of his solutions. This is developed and fixed in the ordinary manner. It shows no trace of color. From it a print is taken on glass or paper, the plate or paper being specially prepared by treatment with the same solution. The transparency or the paper print in no way differs to all appearances from an ordinary positive, and shows no trace of color by transmitted or by reflected light. It is then washed over successively with three colored solutions, blue, green, and red, and it takes up the appropriate colors in the appropriate parts, these three colors giving, by their various combinations, all varieties of hue. How it is that this power of selective absorption is given to the components of the photographic image (principally, of course, metallic silver) is, it appears to me, the interesting question connected with the process. The action is certainly previously unknown, and it will as certainly repay scientific investigation.

As I declined to be convinced by mere inspection of the finished results, M. Chassagne was good enough to demonstrate the whole process for my benefit, and by the kindness of Professor Thomson, of King's College, the demonstration was allowed to take place in the laboratory of King's College on two mornings last week. Professor Thomson and Mr. Herbert Jackson, of King's College, were present on both occasions, and Captain Abney on the second. I must not speak for those gentlemen, but I believe they were as much impressed as I was myself by the remarkable nature of the process and its results.

That such results should be obtained by such a process seemed *a priori* in the highest degree improbable, but obtained they certainly were.

The photographs taken by ourselves were poor, the light (on the morning of Wednesday, 20th) being extremely bad. Nevertheless, the positive (made by one of ourselves on the following day) showed with perfect distinctness, when treated as above described, the colors of a bunch of flowers I had bought at Covent Garden, on my way to King's College, and of various other test objects.

Our own experiments were confined to gelatine films, but M. Chassagne treated with complete success some paper positives he had brought from Paris. These looked like ordinary silver prints toned with gold, but I omitted to ask about the toning.

Further experiments and independent investigation (for which M. Chassagne has kindly promised me the materials) will, no doubt, throw further light on the nature of the process, but I cannot believe that any investigation will throw doubt on its genuine character, for it was carried out under test conditions last week, the sole reservation being the nature of the materials employed.

I hope that a fuller account of the method may shortly be presented to the Society in the form of a paper, but in the meantime it appeared to me that members of the Society would be interested by having placed before them the first information about so remarkable and promising an invention.

A Novel Mode of Thawing Frozen Water-Pipes.—Our contemporary, the *English Mechanic*, has recently given a novel method of overcoming a seasonable difficulty which, at this time of the year, is often of especial trouble to photographers, the thawing of frozen water service pipes, which, as every one knows, is apt to seriously delay all printing and dark-room work. It goes without saying that heat is the only remedy, the difficulty is how to apply it with the best chance of success. The new plan is simply to place unslaked lime around the pipe, keeping it in its place by straw wrappings, and then to pour on water. If the lime is properly applied and kept in its place, the heat given off by the slaking of the lime will be so great as to effectually prevent the frost effects. The same method, in a slightly different form, is recommended for preventing the freezing. The lime is similarly applied and kept *in situ* with straw, but, instead of adding water, the moisture of the atmosphere is allowed to play, and its gradual absorption by the lime leads to a constant rise of temperature sufficient, till the lime is slaked, to maintain a fluid condition of the contained water.—*British Journal of Photography.*

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NOTES.

An Acetylene Society has been organized in France.

Keep prints face downwards when washing, toning, or fixing them.

The Calcutta Photographic Exhibition contains a number of pictures by American amateurs.

The Photographers' Association of Michigan recently held a most successful exhibition at Detroit.

"It is pathetic," says the *Art Journal*, "to see how photographers strive on hopelessly to prove their craft an art."

The Camera Club (New York) contemplates holding a *Salon*, similar to those held in London, Paris, and Vienna.

The British Museum has accepted a gift of a number of Animatograph films. In years to come these will be of considerable lecture interest.

Is the Problem of Photography in Colors Solved at Last? One is almost inclined to believe so on reading the remarks of Capt. Abney and Sir Henry Trueman Wood, both reliable authorities.

Duty on Cinematographs.—In Switzerland the duty on Cinematographs and similar instruments for displaying chronophotographs has been fixed at sixteen francs per 100 kilogrammes.

Anti-halation.—At a recent meeting of the Grand Section of the Association Belge de Photographie, M. Goderus stated that, by using a diaphragm of about *f*-200, the light is so feeble that it cannot penetrate the film, and therefore halation is not caused.

"Photographic Life" is the title of a new English weekly photographic magazine. It is edited by Walter D. Welford, at 19 Southampton Building, Chancery Lane, London, England. It is published at one penny weekly, and is good value for the money.

Mr. H. W. Nash writes: "The bronze medal awarded to me in the animal competition was received to-day. Accept my thanks. I prize it very highly. I have been an amateur photographer for fifteen years, and this is the first competition I have entered."

Very truly yours,

H. W. NASH.

Application de la Photographie a la Medecine par Le Dr. A. Burais, published by Gauthier Villars et Ciè, Paris. This little work deals in a very thorough manner with the application of photography to medicine, and is illustrated with photographs of bacilli, X-rays pictures, and chronophotographs.

The Wave-Length of Roentgen rays, says a foreign contemporary, has been ascertained by Dr. Fromm, of Munich, at fourteen-millionths of a millimetre, that is about seventy-five times smaller than the smallest wave-length for light. This determination was based upon interference phenomena observed by Dr. Fromm.

Ruskin's opinion of photography as an art was never a high one, although he occasionally made use of the camera himself. In a letter to a friend, written in 1876, he says, "If this accursed weather stops photography just when I want to use it—the devil really deserves some credit—5 per cent., at least.

The Corless Art and Camera Club of Newburyport, Mass., is to hold an exhibition of photographs this month. We are informed that 1,000 pictures will be exhibited by its forty members. This is a good average. We have nothing to say regarding the quantity but the quality—well, we have not seen the pictures, so can form no opinion, but we can imagine.

Metol Developer Without Alkali.—Kastner states that if metol is used without any alkali, all plates will give absolutely clear glass, and that plates which have received various exposures may be developed in from ten to twenty-five minutes, with all details, with perfect immunity from fog. The developer may be repeatedly used, and gives prints on bromide paper with blacks equal to platinotype.

New X Rays.—Professor E. Friedrich, of Elbing, Prussia, informs the Vienna Academy of Science that he has discovered some new kind of rays by which it is possible to determine definitely whether death has taken place. Professor Friedrich maintains that these rays, which he calls "Kritikstrahlen," are so sharp that they pass through the body almost in a moment; and produce pictures on the photographic plates differing according to whether the body is dead or living.—*Daily Chronicle.*

The Topeka Camera Club have held their third annual exhibition. Over two hundred pictures were exhibited.

The present membership of the Club consists of 40 active, 15 honorary, and 1 non-resident member; its officers and directors being: W. C. F. Reichenbach, president; W. E. Swift, vice-president; W. E. Culver, treasurer; F. M. Tuckerman, secretary; R. H. Lea, H. W. Seery, R. H. Gaw.

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Tinting Prints.—A brown tint, resembling an old engraving, can be produced on prints by soaking them in a solution of tea or coffee. Make an infusion of either, filter it, and use when cold, swilling the prints in water afterwards.

Another method, but with bromide paper only, is to develop with a dilute pyro-soda developer. The image will take a considerable time to develop, during which the paper assumes a distinctly brown tint, and if the paper has been well soaked in water prior to development it will be evenly tinted all over.—*Photographic News.*

Curious Lantern Experiment.—Mr. Croft, at a recent meeting of the Physical Society, among a variety of simple and beautiful experiments, exhibited one which would form a very interesting addition to the lanternist's *repertoire.* A double lantern is so arranged that the light dics partly overlap one another. A sheet of green glass is placed before one objective, and the light from the other decreased till the illumination is about even. The overlap is then apparently white, while the uncovered disc appears red. Professor Sylvanus Thompson was surprised to learn that the experiment could be successful when only patent plate glass was used.—*British Journal of Photography.*

The Royal Photographic Society Council.—The following gentlemen have been elected as members of the Council of the Royal Photographic Society: President, Lord Crawford; Vice-Presidents, Sir H. Trueman Wood, T. R. Dallmeyer, J. Spiller, J. Chapman Jones; Treasurer, G. Scamell; Ordinary Members of Council, T. Bedding, T. Bolas, F. A. Bridge, J. Cadett, E. Clifton, A. Cowan, W. E. Debenham, F. E. Ives, F. C. Lambert, J. W. Swan, A. Mackie, J. W. Marchant, A. Pringle, J. Sinclair, A. Spiller, E. J. Wall, H. Snowden Ward, L. Warnerke, P. Waterlow, H. Wilmer.

Fixing Prints With Salt.—M. de Saint Florent, recalling Liesegang's experiments on the fixation of prints with an alkaline chloride, such as magnesium, details some experiments he has made, using magnesium and sodium chloride, and he finds that prints are not eaten out, and that the half-tones do not suffer. He proposes the immersion of prints for four or five hours in a bath composed of

Saturated solution of salt	100 parts
Saturated solution of hypo	0.5 parts
Water	100 parts

Prints may be left in this for twelve or twenty-four hours without harm. This bath must be made fresh every day.

A New Form of Gold.—Many years ago a curious and anomalous property of a mixture of hypo solution and chloride of gold was pointed out in these columns by a well-known contributor, and recently Mr. Carey Lea has described another singular gold experiment in the current number of the *American Journal of Science.* About half an ounce of a ten per cent. solution of hypo is placed in a small beaker, and about fifteen minims of of a ten per cent. solution of chloride of gold added, and, finally, one drop of sulphuric acid. As soon as the solution begins to darken, an ounce of water is added. The solution then assumes a deep green color, due to very finely divided blue gold suspended in the yellow solu-*British Journal of Photography.*

Thiosinamine Toning.—According to Liardin (*Photographische Mittheilungen*) the following mixture may be used for a combined toning and fixing bath with good results for gelatino-chloride paper:

Water	100 parts
Thiosinamine	100 parts
Solution of chloride of gold (one per cent.)	120 parts

The prints must remain in this bath about eight minutes. If the following chlorides are used, the various tones are obtained. Potassium chloride gives brown; salt, yellowish brown; cadmium chloride gives first orange, then gray green; aluminium chloride gives grayish brown, yellowish brown, and greenish gray tones; nickel chloride gives yellowish sepia; cupric chloride in fresh solution, yellowish green, when old, gray green; platinum chloride, gray brown; potassium chloro-platinite, brown; gold and potassium chloro-platinite gives blackish violet; and aluminium and platinic chloride, brownish sepia.

Detroit Convention.—It is probable that one of the most unique exhibitions shown at the P. A. of M. Convention will be a collection of pictures gathered for the occasion by C. L. Weed, of the American Aristo Company, showing the evolution of Photography, from the days of Daguerre to the present time. There will be shown pictures made each year since 1835—first the Silhouette, or cut-outs, then the Daguerreotype, from 1840 to 1858; next the Ambrotype, from 1846 to 1860, made on clear glass, colored glass, leather, black enamel paper, rubber, ivory, iron and tin; and photographs made as early as 1854, and each year since. This will likely be the first illustrated history of picture making ever shown, and will be one of the leading attractions, as several talks will be delivered from them.—*American Journal of Photography.*

Photographic Association of Pennsylvania.—We have been requested by the Secretary of this Association to publish the following letter recently received by him:

My dear Mr. Seavy and Officers of the P. A. of Pennsylvania.

Gentlemen: Upon my return from Harrisburg, I began thinking about how successfully our convention has been, and I find that but one error has occurred. I, like the rest of the officers, made an exhibit at the convention, but not for competition for any prizes. The judges, when making their selection of the banner picture to be sent to the National Convention and placed in the upper salon, they selected from all exhibits, regardless of whether entered for competition or not, this picture was to represent the banner picture of Pennsylvania, the honors fell on me. I unfortunately (in this instance) have two studios, one in this State, and the other one just a little over the line in New York State, on account of a much superior light in my Elmira studio, I made most of my exhibits from there, therefore, my pictures being made from Elmira in New York State, the picture selected would not represent the work of Pennsylvania, and, as that was the intention of the judges, I consider that I am not entitled to the honors, but heartily

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recommend the wonderful picture of an old gentleman reading—in the exhibit of Mr. Flickinger, of Bethlehem—his picture being next in consideration. I sincerely trust that the Board will accept my declination of the honors conferred, and send Mr. Flickinger's picture instead of mine. With best wishes for the future success of P. A., I am,

Most respectfully,

J. B. SCHRIEVER.

The Gilson Adjustable Album.—From the F. H. Gilson Co. we have received a sample of their Patent adjustable album. This is so arranged that it will hold either one leaf or fifty and form a perfect album.



Leaves can be removed or added in a moment by simply loosening the silk cord.

For collections of photographs this album will be found very useful. There are no disappointing blanks leaves even though there are only one or two photos in the collection, and yet the collection can be increased to one hundred photos. The especial advantages of this album for a small collection, subdivisions of a large collection, or for gifts of various sized collections, are too obvious to need further remark.



The bindings are the best of their kind. The cloth album is bound in one of the new art cloths. The half leather is bound in the best seal grain leather and art cloth. The full leather is seal grain throughout. All the bindings employ a silk cord.

The word "Photographs" is stamped in gold in a very attractive design near the upper left hand corner, leaving the center of cover free for the stamping of the name of the collection which it may contain.

Soul Photography.—The quidnuncs of both hemispheres, stimulated by sensational papers, have been interested in Narkiewicz's experiment, in which a person holds an electric condenser in his left hand and a Crooke's tube in his right; then, if another person approaches, the tube lights up, and, if he touches the globe, sheafs of light escape from his hand—milky and opalescent, with a golden center—more brilliant when the toucher is a strong person. This effect, in a photograph, is much like that of the first explosion of a snaky rocket, seen high in air. This is called "electricity combined with the human fluid." Along with this is Dr. Baraduc's photograph of "the human fluid" alone, made by placing a photographic plate on the stomach of a fever patient. The photograph looks like white "spatter-work" on a dark ground.

On this subject, the *Literary Digest* remarks that "France is the paradise of those who frequent the border-land between science and quackery. We hear nothing of it if we rely on the staid scientific journals of England, Germany, or the United States." No great weight, therefore, is to be given to the mere fact that a questionable paper has been read before a Parisian scientific body.—*Popular Science News.*

International Exhibition and Market.—It has been decided to hold in London, at the Royal Agricultural Hall, Islington, N., from June 23d to 30th next, a photographic trade and art exhibition. Considering the great advance made in recent years in photography and allied arts and its very numerous amateur adherents, it is remarkable that a gathering of a like character has not been held before. The gentlemen who are managing this large undertaking are experts at the work, and are connected with several of the most important class and trade exhibitions that are held at the Royal Agricultural Hall. This gathering should afford an unique opportunity for the trade from all parts of the world to meet, as it is to take place during the auspicious week of the great reign of Queen Victoria when visitors will be in London for the fêtes.

Photographers' Association of Virginia.—President A. H. Plecker, of Lynchburg, Va., has issued a circular, in which he announces that the time is drawing near for the First Annual Convention of the Photographers, Association of Virginia. He wants to see a large and handsome display in Richmond, on March 23d to 25th, 1897. Plecker says: "We have the metal and talent in this State, and I want to see it brought out. Let us not be behind other States, but go forward with our art and show to this blessed country of ours that Old Virginia will plant her photographic banner as high in the art as any other State, and she can do it if she will just lay hold. Remember, there are thirteen gold and silver medals to be awarded, and one or more are for you, should you be found worthy. That is something for which to strive; but give us the pleasure of your presence, even if you do not exhibit. Hang a card on your door, saying you have gone to Richmond to attend the Photographers' Convention, and it will help your business, as your customers will say, "He is up with the times"; and a week off will rest you up and fit you for your spring trade."

For further information, write to Secretary H. V. Lineback, Roanoke, Va., or A. Homeier, Richmond, Va., for space for your exhibit.

The Photographers' Union.—The above organization was effected November 24, 1896, at McCoy's hotel, Chicago. Its objects are to check further reduction in prices, shorten hours of labor and to inaugurate an effective apprentice system. While the carpenter and plumber work eight hours per day at a good salary, the photographer has, if he is an operator, to develop negatives after his day's work is done under the light; if a printer, to tone or mount prints after printing all day; if a retoucher, at the present prices, he has to borrow the night to help him make a salary such as the other tradesmen can in eight hours.

The reason is obvious. For the past decade the trades have effected wonderful reforms in increasing salaries, shortening hours of labor and regulating apprentice systems, by united efforts, and have reaped untold benefits even during the latter years of depression by united action. They are all under the control and guidance of the Federation of Labor of America and thus form a

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formidable power. They have secured legislation in nearly all States in the interest of labor, such as eight-hour laws, mechanics' lien laws, and many other measures. While the trades affiliating with this body have steadily been benefited, the condition of the unorganized photographer has gone from bad to worse. Originally the dry plates, but latterly the manufactured papers, especially with their staff of demonstrators, have made photography so simple that in nearly all cases boys are employed at small salaries to do the work, when formerly experienced men were employed. These cast-off men open studios on slender capital and have to cut prices to pieces in order to exist, especially where the department evil has broken into our trade; who, buying stock from manufacturing houses at dealers' discounts, are therefore enabled to make photographs at a minimum of cost and can advertise work cheaper than the legitimate photographer.

The union is in possession of a charter from the Federation of Labor, and is therefore a part of the whole organized labor movement and is backed by the same. It will have a delegate to the Chicago Federation in a short time, possibly after the next meeting of the union. There are in round numbers 520,000 union men in Chicago who will patronize only union galleries and look for the union stamp on photographs and eschew department stores. The union has only the good of the profession at heart and our benefit will also be that of the employer. The initiation fee for a limited number of charter members is $1, which number is not filled. Any communication may be addressed to C. F. Krauss, 42 Loomis street, Chicago, or to Charles Hallender, Secretary.

The union meets every first and third Friday, at Building Trades Council Hall, 187 Washington street. The officers are: C. F. Krauss, President; William Masters, Vice President; Charles Hallender, Recording Secretary; M. E. Charleston, Financial Secretary; O. B. Williams, Treasurer; T. P. Burke, Sergeant-at-Arms.

Photographers' Association of Ohio.—The Executive Committee of the Photographers' Association of Ohio, met at Columbus, O., Feb. 10th, all officers being present. A great deal of routine business was transacted.

The following important changes were decided upon, viz:

To make the '97 Convention a two day session, Tuesday, August 31st and Wednesday, September 1st, being the dates selected.

To hold convention at this time—State Fair week—thereby insuring a R. R. rate to all, of one fare for round trip.

To give manufacturers and dealers floor space in convention hall free of charge.

To abolish the expensive banquet which has burdened our treasury every year.

To provide a room with skylight and furnish it with raised seats where practical demonstrations will be given.

To have an exhibition of negatives with prints from same from the leading studios of America.

To eliminate all restrictions as to size of pictures in the awarding classes.

To select a jury of five photographers and artists for the awarding of prizes, said jury to examine exhibits by consultation, without markings.

To give those fortunate enough to have pictures selected for the Salon a certificate of honorable mention signed by the Salon judges.

To have an art lecture during the convention.

To reduce number of prizes offered thereby, rewarding only exhibits of real merit.

The following prize list was adopted:

Special.—Professional photographers outside the State of Ohio. 1st Picture, no restriction as to size. 1st Prize, Gold Medal; 2d Prize, Silver Medal.

Special.—Amateur photographers. Open to the world. 1s Picture, no restriction as to size. 1st, Gold Medal; 2d, Silver Medal; 3d, Bronze Medal.

Grand Prize.—24 Pictures, no restriction as to size. A Diamond Badge.

Class A.—12 Pictures, no restriction as to size. 1st, Gold Medal; 2d, Silver Medal; 2d, Bronze Medal.

Class B.—12 Pictures, no restriction as to size. 1st, Silver Medal; 2d, Bronze Medal.

Competitors in Class B must be from towns of 15,000 or less.

Class C.—12 Pictures, no restriction as to size. 1st, Silver Medal; 2d, Bronze Medal.

Competitors in Class C must be from towns of 5,000 or less.

Class D.—Views, Interior, or Exterior. 6 Pictures, no restriction as to size. 1 Silver Medal.

Class E.—Commercial Work. 6 Pictures, no restriction as to size. 1 Silver Medal.

Class F.—Portraits from negatives made by artificial light. 6 Pictures, no restriction as to size. 1st, Silver Medal; 2d, Bronze Medal.

RULES.

All pictures must be from negatives made since last convention.

Officers of Association cannot compete for prizes.

Competitors cannot compete in more than one portrait class.

Competitors in all, except two special classes must be members in good standing of the Photographers' Association of Ohio, and residents of Ohio.

Members from towns of 15,000 or smaller may compete in any class subject to rules governing the same.

All pictures, whether in competition or not, are eligible to the Salon.

Professional photographers outside the State desiring to compete for Special Prize are requested to accompany their entry with a fee of $2, thus becoming an honorary member.

Amateurs are requested to pay a fee of $1, which must accompany their entry.

All pictures must be framed ready to hang.

Entries to close Aug. 28, 1897.

All art exhibits to be sent to I. Benjamin, 1st Vice-President, Photographers' Association of Ohio, City Hall, Columbus, O., all charges prepaid.

Positively no exhibits will be received later than noon, August 30th.

Entries are to be made to the Secretary, L. A. Dozer, Bucyrus, O.

We extend a cordial invitation to photographers, both professional and amateur, manufacturers and dealers, one and all, to meet with us and assist in making this the greatest State convention on record.—L. A. DOZER, Secretary.

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TRADE NOTES.

The Thornton-Pickard Co. will be converted into a limited liability company.

The C. W. Quinn Dry Plate Company has been organized at Henderson, Ky., with a capital of $30,000. This process of making photographic dry plate was invented by C. W. Quinn.

The Firm of Rough, Platzer & Caldwell, the background makers of 156 West 29th Street, has been dissolved, and the business will be carried on at the same place by Messrs. Rough & Caldwell.

W. D. Gatchel Sons send us a copy of their latest catalogue. A glance through its pages is sufficient to decide that the firm supply every article the photographer can possibly want. It is neatly and carefully gotten up. We advise all to obtain a copy.

Collinear Lenses.—A reduction in price of the famous Collinear Lenses has recently taken place, and the agents for these lenses, Messrs. Benj. French & Co., Boston, Mass., have notified us that the greatly increased demand for the Collinear Lens has enabled the makers, Voigtlander & Son, to lower the price. A descriptive and revised circular, with new prices, can be had by application to the American agents, Benj. French & Co., Boston, Mass.

The Meyer Brothers Drug Company, of Saint Louis, Mo., informs us that in addition to the chemicals required for the photographers' use which they formerly carried, they have recently opened a new department, comprising a complete line of photographic supplies, both for the professional and amateur trade. An illustrated catalogue will soon be issued, introducing the latest and best, as well as a full representation of all the regular staple goods necessary to the art. They have secured the services of Mr. W. T. Jones to superintend that department; the gentleman is well known to the profession.

The Simplex Roller.—The latest ingenious device in print rollers is the "Simplex," recently introduced by The Scovill & Adams Co. of N. Y., of which the accompanying illustration gives a very good idea.



Its name is particularly appropriate as the print roller is simplicity itself. We recommend our readers to adopt it. One of the objections to the print rollers, which have heretofore been on the market is their unwieldly bulk as well as their greater cost. The "Simplex" is cheap as well as effective.

NOTES ABOUT PHOTOGRAPHERS.

F. J. Harrison has resigned from the editorship of *Anthony's Photographic Bulletin*.

W. I. Scanlin will, we understand, fill the vacancy left by Mr. Harrison's resignation.

Capt. W. de W. Abney has resigned from the presidency of the Royal Photographic Society.

F. E. Ives has been elected a member of the Council of the Royal Photographic Society.

Prince Albert of Belgium has accepted the honorary presidency of the Association Belge de Photographie.

Sir J. Herschel once gave it as his deliberate opinion that photography would never be used for astronomical research.

Mr. Blair, the well-known maker of films and cameras has, in conjunction with a Mr. Pando, patented a new animated photograph machine.

M. C. Berthiot the eminent French optician, died recently. He took out many patents relating to photographic lenses.



SHAPOOR N. BHEDWAR.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF JANUARY, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

576,203. Photographic Printing Frame. William H. Lewis, Huntington, N. Y., assignor to Mary L. Lewis, same place.

A back-plate or pressure board for a printing frame is formed of two parts, connected by suitable hinges. A bell crank lever is fulcrumed upon each of these parts, and two springs are arranged at each side of the frame, so as to engage with the respective ends of said bell cranks.

576,435. Negative Slide and Film Illuminator and Camera Obscurer. William A. Eddy, Bayonne, N. J.

A suitable box is provided with an outwardly movable rear wall or cover, having an aperture in its upper portion, an inclined apertured support being arranged at the front end of the box. A suitable mirror is located at the bottom of the box, and arranged to throw the light entering through the aperture in the rear wall on an article placed on said apertured support.

576,542. Picture Exhibitor. George W. Browne, Colorado Springs, Colo.

The inventor employs a casing having a phonograph therein provided with a suitable motor. Drums are journaled in the casing, and are driven from the motor of the phonograph, a flexible strip being arranged to pass over said drums, and provided with pictures. A suitable eye-glass, through which the pictures are visible, is carried by the casing, and a reflector is located at one side of the eye tube, an illuminating device being arranged on the other side thereof.

576,640. Process of Embossing Photographs. Gustave R. A. Weimann, Brooklyn, N. Y.

This process consists in placing a translucent carvable plate over a negative or positive of a picture and carving thereon an approach to the actual shape of the objects represented in the picture. A mould is then made from said obtained carving, and a positive photographic or other reproduction of the picture is pressed into the mold so as to emboss the same.

576,821. Flash-Light Attachment for Photographic Cameras. Isaac F. Pheils, Woodville, Ohio.

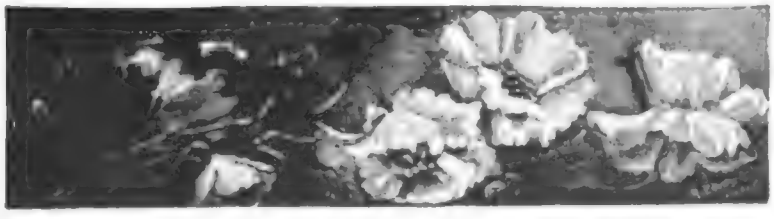
A suitable base is provided with means for holding the flash-light substance, a lid being also pivoted to said base. A spring-controlled cover or shield is adapted to cover and retain in place the flash-light substance when said lid is closed.

577,373. Method of Reproducing Photographs. N. S. Amstutz, Cleveland, Ohio.

A pictorial image is formed with continuous parallel lines in the half-tone portions thereof after which a suitable tracer is moved there over a about right angles, whereby electrical impulses of varying duration are formed, such impulses being recorded in an engraved manner upon another surface

577,469. Automatic Stereopticon. W. L. Veley, Chicago, Ill., Assignor one-half to G. L. Brownell, same place.

In connection with a lens and a source of light the inventor employs a wheel provided with a series of lantern-slide frames upon or near its periphery, said frames being arranged to intervene in their path of rotation between said light and lens. Means are provided for rotating the wheel and an escapement mechanism is arranged in operative proximity to the wheel for alternately engaging and releasing the same. A shutter is employed to cut-off the light from the lens, and means are provided for automatically closing the shutter during the movement of the wheel for the purpose of shifting the slides.



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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

MAY, 1897.

Number 5.
SINGLE COPIES, 25 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.



THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH ST. NEW YORK.

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The First Quarrel

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THE
PHOTOGRAPHIC TIMES.

VOL. XXIX. MAY, 1897. No. 5.

THE NUDE IN PHOTOGRAPHY.

BY GLEESON WHITE.



By COUNT VON GLOEDEN.

AT THE very first mention of the "nude" in art, one passes from questions esthetic, about which people fight as bitterly as about politics or religion, to ethics, morals, and prejudices, with a still more highly-charged atmosphere. For the very existence of the unclothed figure in art is still only permitted under protest by a very large number of people. Now, however much you differ from their conclusion, you feel that it is one inspired (nominally, at all events) by honorable motives; and colored by prejudices though it be, is all the same founded on a mistaken ideal of purity. True, that I, for one, think its manifestations reveal often enough a most distorted bias; but such a belief is purely a personal one. The opponent of the nude in Art has as much right to his opinion as I to mine. The fact that thousands of artists have proclaimed it holy does not suffice to make it so; or, rather, does not make it so to the man or woman whose mental attitude rebels against it. To those who believe honestly and thoroughly that the idealized presentment of the human form is the most beautiful of all possible subjects, it may seem sacrilege to confess a doubt. But there are two ideals of purity—and each finds champions firmly convinced by their own arguments. All you can ask from opponents, therefore, is that they will grant that admirers of the pictured nude may be inspired by motives as free from taint as are those who condemn it.

This is a purely unprejudiced attempt to define the position. Speaking in its defence, it is very hard to realize that the Puritanic howl against a modest and idealized naked figure can be really clean-minded and abstractedly disinterested. Yet each party must be willing to impute no mean motives to the other if it would justify its own faith.

But even supposing that the majority of people are willing (as in most civilized centers they are) to admit the ideal nude in painting or sculpture; it is a much greater demand to ask that they shall also tolerate all sorts of examples of the nude in photography. Indeed, its most ardent champion will find, in such a case, a very sharp line has to be drawn. You have but to put yourself in the position of an exhibition committee, or an editor of an illustrated magazine, to realize this very quickly. Many things perfectly inoffensive in themselves cannot be exhibited publicly without danger of being entirely misunderstood.

The editor of a most popular art magazine told me the other day that he had protested against the action of a certain library committee, in causing his journal to be removed from the public tables, and reserved for readers who sent in a special ticket. However, the reply was to the effect that whenever a nude picture appeared, it had been scrawled upon by louts, who wrote also offensive remarks upon the margin. Then he appreciated the old truth that pearls—of beauty as of other kinds—

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STUDY BY F. H. DAY

must not be cast indiscriminately before swine.

All the same, for a technical magazine, appealing specially to an audience of serious art workers, there must needs be more freedom. The surgical and physiological studies which our sons and daughters take up, are at once put outside the domain of morals. To protest reminds one of the anecdote of the old-fashioned country woman, who, remonstrating about her daughter at a school being taught the elements of physiology, said to the teacher, "Ma'am, I don't want our Sairey Anne taught no more about 'er inside; it ain't no manner of good—besides, it's rude."

The pictured or sculptured nude has always been, more or less, of an offense to Puritan England, both old and new. Perhaps from their reverence for the naked truth they dislike all possible rivals. Be it as it may, the nude and the lewd are still synonymous terms to many worthy people.

Indeed, the kingdom of the nude seems more removed from every-day life than is fairyland itself. Yet a few thicknesses of fabric alone separate it from us. But this slight barrier is socially immovable, based as it is on the custom of centuries. Even in words it is not easy to describe the unclothed modern without offense. One remembers the caustic passage in Carlyle's *Sartor Resartus*, where he portrays a House of Lords—who, like the existing one, might, perhaps, be mended—whose clothes could not, however, for the simple reason that they had none. Or, take another and more recent instance, in Rudyard Kipling's "Taking of Lungtungpen," a story of the capture of a village of Dacoits, where the troopers swim a river and seize the place by night, to be discovered, on parade the next morning at sunrise, "Five and twenty privits, and an orficer of the line, without so much as would dust a fife between 'em all in the way of clothes. They was as naked as Vanus."

Now, both these scenes are intentionally comic, and may just escape Mrs. Grundy's censure, in the comparative obscurity of printed description. But imagine what chance an artist's translation of the incident into pictures would have with the editor of any respectable periodical. If we realize that such drawings, with careful selection of actual facts, and omission of many details, would yet be impossible, it is easy to see that photographs of either scene would need be more frankly realistic and un-

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suited entirely for public exhibition. And, if these comic scenes are outside the conventionalities of modern life, what would be the chance of a photograph of the subject of Mr. Norman Gale's charming poem:

"The brook told the dove, and the dove told me,
That Cicely's bathing in the brook with other virgins three."

Mrs. Grundy was restive on the appearance of the lyric, and would probably speak very plainly if she saw photographs from life illustrating it.

Therefore, it would seem as if the nude in modern life were outside the domain of literature as it is outside the field of the painter, save in a few trivial exceptions; and absolutely outside the pale of the photographer. But this is the case, one feels, where the nudity itself gives a comic aspect to the incident or is displayed for sentimental subjects. For in times when prudery went to far greater lengths than the present, "Susannah and the Elders," and other biblical themes, most artlessly portrayed, were actually allowed in Nonconformist back parlors, while in earlier and more prudish monastic days, pictures of "Adam and Eve," "Saint Sebastian," and a very few others were even tolerated in the churches.

So that it is quite evident that we must needs consider our topic here quite seriously and entirely from an esthetic standpoint, since ART alone can sanction its introduction. In doing so, it is not proposed to raise the question whether artists are justified in depicting the Ideal beauty of the nude, for that has been decided already. Art has always (and always will, I trust) reserved to itself absolute freedom in representing the ideal. It is in the representation of the Real that the choice has been less unfettered and is still rigidly limited.

With the Renaissance came a stronger reaction; until, with Rubens and his school, the so-called Ideal had been brought down to realistic presentations of both sexes, sprawling on ceilings, and posing as the heroes and heroines of sacred as well as of secular art. But although to-day the painter of the "ideal" has full license to employ the nude within certain limitations, photography is essentially the art of the realist. The painter may select the beauty of a dozen models to combine in one perfect figure. The camera (setting aside the composite photograph) must not merely be satisfied to depict the actual figure which confronts it, but must, even then (with few slight alterations), record its accidents and imperfections as clearly as its



A PIPING SHEPHERD BY WILL H. WALKER

beauties. It cannot add to, or subtract from, what is before it, save to a limited extent, nor can it suppress details. More than this, it is debarred from the great mystery of color, and has not, like the sculptor, the full loveliness of form to give in exchange. It is true that in photographs specially prepared for stereoscopic slides (the process where, according to the rules of grammar, two negatives make an incontrovertible affirmative), this last objection practically vanishes. But, although I am told the nude has been treated in this way, I have not met with any examples so far.

Yet despite these strictly defined limitations, one need consider that photography should be unconcerned with the nude; but granting at once that it has been able, in many ways, to depict it with complete success, one may ask to what extent it may hope to go on recording the undraped figure; and more especially if any useful purpose can be served in so doing.

I do not propose, however, to drag in the question of morals. Curiously enough, to talk of morality usually ends by talking of immorality. Yet it is best to state very plainly that no matter how the accident of social conditions may distort our views, *the nude is not necessarily*

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synonymous with the lewd. Indeed, the foolish habit of considering nudity itself improper is responsible for much evil. Secrecy is always a stronghold of superstition and the unknown gains a specious attraction as the unlawful.

But we must face the fact that to the prude most things are rude. And without allowing that most superfluous type of prig to dominate our own taste we must try to avoid giving *it* (one cannot dignify a prude by assuming it can be male or female) any reasonable cause of offense. Any reasonable cause, mind you; for if folks are unreasonable, you cannot prevent the most innocent actions offending them.

But the photographer who is struck by the varied and beautiful studies he can obtain from the nude model must also recognize from the first the limit of his craft. As we have seen, he cannot choose the best portion of half a dozen models and then blend them artistically into one perfect whole—he cannot strengthen a weak figure by imparting to its proper contours the proportions found in antique statues. To take a single instance, the iliac line. This in ancient sculptures almost invariably takes a direction which is so seldom encountered in real life that only one or two instances have been reported. "The Diadumeno," that statue which embodies the canons of the Greek figure, shows it clearly. It is the line descending from the hips, which in the antique commences to start almost horizontally below the fleshy ridge of the abdomen, and then bends downward at an obtuse angle and pursues a convex curve.

This instance is only selected to prove that not even entire absence of malformation satisfies you in a quest for a living human being who shall rival the Greek standard of perfection. To find even so much is by no means common; any one who knows the scarcity of well-formed feet, owing to their being cramped in leather from childhood, and the other deformities wrought by wearing clothes, can supply a hundred instances of failure to one of even modified success. None of these take into consideration an item that is of even greater importance, the facial expression of the model. A fully developed and really symmetrical figure very often exists with a stupid or positively repulsive face. It may be possible to build up a composite nude study (I hope it isn't,) but if you could add the head of a more pleasing sitter, and the feet of a third, however skillfully you "jine the flats," the result could be entered as a serious rival to a fine drawing of the same figure wherein every part was modified in conformity with non-existent ideal.



Photo by Baron Corss.

NUDE STUDY

All of which argument leads us to the conclusion that, picture-making from the nude is hardly photographic to be commended. The variety of subjects which know nothing of these limits is not small; and to attempt one, not merely bristling with difficulties but confronted from the first with almost certain failure, is not worth the effort. But if on the other hand you are content to strive for fine studies, i.e., pictures where the technical beauties of lighting, pose, contour, or composition are the chief ends, there is no reason why the nude should not contribute many excellent subjects. But compositions of figures arranged to depict a

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Photo by Count Von Gloeden

A STUDY OF THE NUDE

(Taken in the open air)

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Photo by Count Von Gloeden.

A SICILIAN SCENE

classical anecdote, or to suggest "Music," "Poetry," and the like in the abstract are hardly worth attempting with the means at present at a photographer's disposal.

The educational value of real, working studies from the nude seems to be undoubted. It may be said that those who have no opportunity of studying art seriously should leave its more complex problems alone. Yet the figure is often employed in the applied arts, and whether it is introduced nude or draped a knowledge of the form itself is of vast importance. There is scarce a painter of repute who does not make studies from his models in the nude before he paints them. That is to say, no painter who chooses ideal subjects, or compositions based upon historical or allegorical themes. Nobody supposes that portrait painters, or those who depict topical anecdotes follow this method. But where the picture is built up as a decorative composition, the lines of the figures must needs be felt underneath the draperies or costumes, even as the skeleton of a figure must be studied and all the muscles duly observed, before you can draw the living form with any surety.

Studies of separate limbs, of torsos, of feet and of hands are most useful documents for artistic reference; especially to illustrators who often enough do not employ models regularly. It would probably surprise the average person to find how many painters rely on the camera as a constant ally; not to copy photographs directly, but to preserve records of their subjects, and in lieu of tedious preliminary studies. A dozen poses of the model may be taken in a short time, and the one finally selected kept as an unchangeable reference for the pose to be preserved throughout the painting. Again, a record of the nude model in the required attitude is useful afterwards when the same figure is being painted with drapery or costume. The painter can see exactly what the hidden lines are, and it constantly reminds him that he has to impart that feeling of a body underneath the clothes, which imparts solidity and reality to his work. If the subjects are intended merely as working studies for painters, it matters not under what conditions they are taken, the accessories are unimportant. But if they are intended for public exhibition, even in the most limited way—such as showing them to a friend – these said accessories and the environment are of vast importance. Roughly speaking, it may be said that the open air is absolutely essential to remove the idea of nakedness, and suggest merely the nude, which is by no means the same thing. Therefore figures

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Photo by Count Von Gloeden.

A SICILIAN IDYLL.

bathing, or resting on a beach or river's bank, are by the very circumstances of the case, least likely to be objectionable. Even in modern social conditions there is some degree of liberty permitted to open air bathers. Although the prudery of modern life, which is not shocked by the scantiest and flimsiest of attire at athletic meetings, has seen fit to demand a much more effective disguise for bathers in public.

All things considered, Mrs. Grundy—be she of New England or of Old England has no right to object to good studies of boy juvenile bathers, specially if they are as beautiful as the famous "Water Rats," by Mr. Frank Sutcliffe, of Whitby, or "Natives of these Isles," and others by this accomplished photographer. When you touch upon female nudes it is impossible to lay down any rules; the subject teems with difficulty and absolute danger. Indeed, rather than assist in opening it up, one would be inclined to say that, except as studies for technically artistic purposes, the nude female is not a possible subject for self-respecting photographers to-day. It would be more seemly to overstep the mark by such a sweeping assertion as the above, than to frame excuses or propose hypothetical cases where a picture of this class might be attempted without prejudice.

Yet the slightly draped model, or even the complete nude so cleverly posed that any suggestiveness is entirely avoided, may be achieved and exhibited without reproach. In an exhibition of the Photographic Salon, London, if memory serves me, one or two absolutely undraped models were hung on the walls. Certainly the one here reproduced was recently exhibited in same London gallery. But the photographer had arranged his lighting so cleverly that you saw, not a naked human being, but a figure more or less etherealized by atmospheric mystery, and so managed that even on close examination the figures were practically clothed with shadow as with a garment.

The most numerous and frank studies of the nude, which every artist know well, are doubt- those taken by Count von Gloeden in Sicily. Here amid ruins of amphitheatres and fountains and terraces overlooking an exquisite bay, with an old town on the hills sloping to the water, the young figures—whether draped or undraped—for the most look as natural as in any painting of the Golden Age, or of classic times. The defect of some few is that an undue quantity of accessories is employed, flowers in the hair, draperies and feathers, producing a result that recalls pictures by Gerome or Alma Tadema. Some of these latter are in too close

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NUDE STUDY BY GUGLIEMO FLÜSCHOW

rivalry with a painter's version to do ought but exhibit the weakness of the photograph in this particular. A painter can retain the actual features of his subject, can falsify facts to beauty ; so, I shall be told, can a clever photograper, but I do not think the ideal of either painter or photographer in this particular context is a peculiarly high one. The lack of real human interest in a sham antique soon wearies one. The nudes by "Etty" and "David" seem terribly uninteresting to-day, and the best photographic group, posed with all sorts of theatrical properties, is hardly likely to preserve its interest longer than these painted compositions of a past generation.

But in their own way the photographs by W. Von Gloeden, of Taormina, are very remarkable. The "Socrates" is a model who seems to be the veritable philosopher. A young Nero is another really astonishing type. But the actual nudes, studies representing nothing but the beauty of form under various circumstances of lighting, are even more satisfactory. One, a peculiarly decorative composition of a group of youths around an old well-head, is notable example of real beauty obtained by an untouched transcript of nature. The curves of the figures are repeated in the curves of the well-head, and to counteract the effect of all these varieties of that line, which Hogarth called "the line of beauty," the vertical pillars of a cloistered arcade in the background add just the needful touch of severity to the composition. But you cannot do a thing like this by mere wishing. Though you patiently built up a sham scene yet your photograph would reveal its pretence. It is because Von Gloeden's accessories are genuinely antique that his figures harmonize so perfectly with them. Nature is always antique ; and the nude rarely offends if you use landscape for a background, with no trace of recent human habitation. Above all the sea-shore with its curving line of beach, and its still more subtly rounded waves accords more fully with the nude form than even woodland scenery or but a few river-banks.

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An Irish amateur, W. H. A. Collins, has taken several excellent studies of the female nude by the rocks on the seashore, studies which have been publicly exhibited in the London Salon, and are wholly innocent. But the effect of generations who have worn corsets and other cumbersome garments, is apparent in the model which impresses you as "undressed;" and that is a defect which mars the poetry of any composition of the sort; but all the same he has succeeded to an extent beyond that of most photographs of the female in the open air.

A boy in the attitude of the famous *Adorante*, by Mr. H. H. Cust, and a delightful bather, by Mr. J. Gambril Nicholson, and "*The Athlete Resting*," are excellent examples of these well-known amateurs. Nothing in their way could be better than these. Mr. A. B. Langfield also must be commended for a quantity of open-air studies of great artistic beauty and exquisitely delicate sentiment.

Of course the average study of the life model in the studio taken by thousands and used largely by students, is merely a record of a given fact, and, as a rule, of no more artistic value or interest than the average

photograph on the average drawing-table. Very few professional models of either sex possess figures which seem really beautiful as a whole. An expert may appreciate thefinely modeled torso, the muscular development of the arm or some other good point. To a disinterested observer they are rarely attractive in any way. Indeed, to disilluminize one, and to realize how much of the ideal beauty we prize in ancient statues and paintings was created by the artist, one has but to attend an life-class, and inspect critically the specimens of those better proportioned human beings who are selected because they are above the average. Any thing less beautiful, less sensuous, less ideal than the ordinary life-model seen in the sordid surroundings of an art-school it is impossible to imagine. The records of such things are well worth preserving—but only as scientific documents. Nor do I think the ideal is approached much nearer in the pictures of partially draped young women, seated on profile moons, or otherwise posing as nymphs or fairies, which are so popular in reproductions. The coiffures betray the hairdresser, the draperies suggest, not the graces of the Parthenon as much as *tableaux vivants* for some charitable purpose.

Another class of nudes, children, might surely be discussed freely without fear of hurting any body's feeling, *i.e.*, so far as propriety is concerned. But unluckily the parents' ideal of beauty as illustrated in the figures of their offspring and the artist's ideal are entirely at variance. Children, although far more likely to be comely than mature specimens of the *genus homo*, are by no means all of them elegantly proportioned. Too often the artificial arrangement of the hair makes the head look much too big for the body. The fond mothers who allow their babies' portraits to be sent out broadcast as testimonials to the excellence of somebody's patent food, and the fond fathers, amateur photographers, who pose their own little ones, rarely display sufficient perception of the uncomeliness of feature or limb of their progeny. Even here it is a pity for incongruous surroundings of the nursery to be prominent in the picture. The beauty of a well-formed child is quite sufficient to sustain the interest without any extraneous adjuncts—toys and the like.

This attempt to look the difficulties straight in the face must not be regarded as a protest against the nude; it is a plea, on the contrary, for it. Yet a wise counsel, who wishes to press home his argument, strips it of every weak in-



"THE MARBLE FAUN" BY F. H. DAY

cident, and limits it strictly to those points by which he is prepared to stand or fall.

If you can find a really beautiful model pose it among suitable environments, arrange the lighting dexterously, secure the balance of tone so that the hair is not too dark in juxtaposition with the flesh, and infuse the artistic instinct of selection, accentuating certain points, ignoring others, the result may be a thing of genuine beauty. For the exquisite grace of a perfect human figure is beyond all words, and the photography which is so exact in its record of surface, silhouette, and contour is peculiarly fitted to undertake the task. The result may be a thing to admire and to study—a really beautiful and lasting impression of a beautifully recorded subject

Remember also that there are not a few people who affect to defend the sanctity of the nude, and yet infuse their pictures with a quality unconcerned with art. In such a context one must criticise the result as unsparingly as a most bit-

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ter enemy would. If with even no shadow of intention the effect of the photograph can be distorted to unwholesome suggestions, it is surely the duty every artist owes his art to sacrifice his own achievement, no matter how good its technique may be, rather than it should offend the canons of good taste.

In England an idea has long obtained that Americans are more sensitive than ourselves, and the *Century*, when in illustrating a superb statue "Teucer," by Hamo Thornycroft, it draped the bronze with a silk sash, left on record one fact to support the view. Tricks like this should be discarded. If you have not the courage to photograph your subject without having resort to makeshift expedients of this kind it were best left alone. For to really modest people the ridiculous subterfuge of unsupported drapery is more offensive than its absence. For studies no such care is needful. But in a photograph intended for exhibition, any doubt of its being decent is a proof that for such a purpose it is not. "There was never a woman of doubtful reputation," some one once said, "if it is doubtful, it is certain." So, "when in doubt suppress" may be a useful maxim for a photographer who experiments with nude subjects.



CHILD STUDY BY FRED. BOISSONAS

There is one practical point of very great importance which cannot be put in words ever so discreetly. But if one says that an artificially trimmed growth of hair, like a mustache, seems always out of keeping with the nude and that even a beard on account of its color especially, is not a welcome adjunct on a life-model, reading between the lines will be discovered an obstacle which confronts photographers always and does not trouble the painter. Another point closely allied to the foregoing is the tendency of a photograph to darken the hair, so that it looks black against the flesh; especially is this felt when the figure is against a white background. Yet, as a rule for the nude, a light background serves to show the subtle modelling of the form to better advantage than when it is shown in sharp contrast upon a dark one.

The semi-draped figures by C. Puyo are excellent instances of the pictorial nude; others by R. le Begue come into the same class. In these in lieu of drapery, which, however flimsy, will never come out sufficiently transparent to reveal the limbs beneath, actual net has been used with pleasant effect. But in all such cases the photographer is sailing near the wind whether in England or the United States; possibly on the European continent he would be more free.



CHILD STUDY BY FRED. BOISSONAS

The particular direction where I think that photographs of nude models would offer distinct assistance is in records of artificial poses to fill certain defined architectural spaces, span drils, lunettes, caryatides, and the like. By comparison in these a student would be able to see where nature is to be modified, where certain details have to be simplified, and so base his convention upon nature itself,

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not upon the convention of other sculptors or painters before him.

Akin to this is a project I have mooted elsewhere—viz: to photograph suitable models posed side by side with famous statues, under the same conditions of lighting and, of course, to the same scale and from the same point of view. The lessons such photographs would teach are many. A student would see where the artist idealized his model, where he followed almost literally, and would realize that importance of selection and idealizing facts which to-day at all events we recognize as the chief aim of art.

This unorthodox study by help of photography is not recommended to supersede the genuine studyfrom the life model. But, as I said before, there are hundreds debarred from professional tuition, not only in the smaller towns of America and the Colonies, but in large cities; and not a few who have passed through the schools in early years, who would be glad to have such documentary evidence always at hand for reference. In many localities one who would study direct from the life has local prejudice to encounter, as well as costly preparations to make, before he can export professional models from larger cities. Of course it may be said that in such cases he should abandon the nude and not endeavor by makeshift to succeed in the most difficult task that an artist can essay.

Surely, however, if this be true of pictures and statues, there is less reason to be so draconic in black and white, for ornamental designs, if he wishes to introduce conventionalized figures into his ornament, it were better that he should have the partial truth that a photograph can supply him than none at all.

But all these points, I fear, concern the draughtsman more than the photographer. Only it seemed best in touching on the nude in photography to show that it may have a sound and useful reason for existence, and should not be set down as a fad, or a specious endeavor to produce classic subjects and still less as a method of producing works for reasons that it is more seemly to ignore, though none of us forget that they exist.

Of the technical question of lighting and posing of backgrounds and accessories, of the posing and grouping of infants, and a thousand and one things I have said nothing, for unless one is absolutely sure of facts proved by personal experience it is best not to lay down the law, and my experience is not wide enough to justify its being brought forward prominently.

After the fashion of enthusiasts concerning their hobby, I feel it would be quite proper to forecast the invasion of the nude into the portrait photography of the future. But if a classic revival sets in with the coming century, possibly our heroes will be represented in classic costume even as Dr. Johnson is immortalized in St. Paul's Cathedral, London, as a sort of Hercules with a bare sheet for drapery, and so many non-professions are, say, even as Sandow's portrait appears in every window among bishops and other beauties. Then the fashion for young ladies being taken as statues may find unexpected developments yet, that our sons and daughters will be photographed like veritably polished corners of our temples, I greatly doubt—on the whole, one hopes the day may be some distance off. The idea would take some time to accustom oneself to it. In Harvard University they have quite a number of photographs of their famous athletes clad only in the most scanty garment, which Muybridge in his wonderful series of figures in motion, calls (I think) a V cloth. In a report of the New York Penitentiary, if my memory serves me, there are also many nudes taken for hygienic records. Who can doubt but that these records will be of great interest to future specialists eager to see if the human being is improving or degenerating in physique, and for a thousand reasons such documents are of value to specialists.

Finally, it is as well to explain that the arguments here put forward as justification of the nude are not cast in the form of special pleading to convert any one, but merely to reassure oneself as well as one's readers that there is nothing to apologize for, nor to be ashamed of in the orthodox study of the nude—by draughsmen, painters, or photographers; that its beauty is worthy the most serious respect, and that the truest artist is the one who holds it most sacred. But sacred things are not always sacred things, and the nude discreetly treated in photography no less than in painting, may add the records of beauty which all the Arts delight to enrich.

"We cannot compete with Nature in the exquisite beauties she everywhere offers us, or in the minute delicacies of her finish; our only chance is in selection and combination."—Sir Thomas Lawrence.

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ON THE CANAL BY W. H. LYMAN

A CONVENIENT AND RAPID PRINTING PROCESS. BY J. HORACE McFARLAND.

Busy men, of whom I am one, may be glad to know the details of a printing method which will enable them to get good results from their negatives in the least possible time, and with the least complication; a method, too, which gives them prints of any strength, either glossy or mat finish, and, in ordinary use, without any bothersome toning baths.

True, it is a developing process, but without the bother of a red light or a dark-room, as all the work, including printing, developing, fixing, toning if desired, and washing, may be going on simultaneously by the same light, and that light be either day-light, electric light, plain gas-light, Welsbach light, or even a kerosene lamp.

The paper used is the recently introduced "Velox" paper, which may be described as a modified and much improved bromide paper. While very much quicker than any printing-out paper, it is yet by no means so "quick on the trigger" as bromide, and gives without difficulty beautiful black tones, with all the half-tones faithfully preserved. The Carbon Velox seems to me the next best thing to platinum, and those who work Velox with a little patience will probably fall in love with it, as I have. A method which will let one make good prints by gas-light to the extent of twenty to forty in an evening, which will give exactly the same results time after time, and which provides resources for thin as well as strong negatives, is apt to breed enthusiasm in an amateur, who simply cannot for months obtain daylight time for the much-admired platinum process.

As the directions sent out by the makers of this paper do not give as full instructions as I would have enjoyed, some points in my experience may be useful.

I do my printing in my dark-room for convenience, using a Welsbach gas-light, which is arranged on a low portable stand, being the same light which, when behind a sheet of ruby glass, does service for developing negatives. An average negative facing this light at seven inches distance, with a white card-board reflector on the other side of the lamp, gives a fully-

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graded print in from 25 to 180 seconds. I always test the negative with a small strip of the paper, and when the proper time is determined, write that time and the distance from the light on the negative envelope, so that there need be no doubt as to the procedure if subsequent prints are wanted. In practice, it is found that one can judge the proper exposure just about as accurately as the exposure to give in work with the camera. By tilting the printing frame, prints may be modified, and by, on occasion, using a plain gas flame at a distance of three to five inches only from the frame, charming vignetted effects can be produced with very little trouble and no extra appliances. Extra printing on parts of the negative, "dodging" of various sorts, and all the little niceties which those of us who pursue the art-science for the love of it like to employ, are easily available with Velox.

Carbon Velox, the mat or platinum finish, is quicker than the glossy paper; it is best, I find, generally to add five to ten per cent. to the exposure ascertained for the former when making a glossy print.

Now as to the development, which I carry on a foot or two away from the printing light, behind a card-board shade. The makers recommend the amidol developer, which seems in this use to give up the crankiness which makes it a tantalizing thing for negatives. The formula provides for mixing up 50 ounces of developer at once, using that quantity of water to 10 ounces sodium sulphite, and then adding 1 ounce amidol. This mixture may keep, but I prefer to make a fresh developer each time I print, which is very easily done by keeping on hand a solution of sodium sulphite made up 1:10. For working whole plate size, I take 4 ounces of the sulphite solution (I make it with pure water—melted manufactured ice), add to it 20 grains dry amidol, and from 4 to 6 ounces water, filtering this quickly through absorbent cotton. Then comes the important and somewhat uncertain element—the quantity of 10 per cent. potassium bromide solution, which must be added to give clear whites and yet avoid the greenish blacks arising from too much of the bromide. Carbon Velox needs less bromide, and is much easier to control; I find usually that 5 to 10 drops of bromide to 20 grains of amidol is right to give clear whites and rich, silky blacks that are black, with delicate half-tones of a pleasing hue. Carbon will also stand more water in the developer, and the same developer will work longer in good condition, if pure water is used in compounding it. Apparently, it is the condition of the water which governs the bromide; some alkaline waters need much more. Experiment on it, and use just as little bromide as will serve to keep clear whites; add it drop by drop.

The best results for either the carbon or glossy Velox come from using an exposure which will develop to just what you want and then stop. In this medium you don't have to allow for toning or fixing; what you get you can keep, if your fixing bath is held at its proper acidity.

For the glossy paper, nearly double the bromide is needed—10 to 30 drops to 20 grains amidol—and the developer must be kept strong. If the exposure is just right, the prints come up fully in a very few seconds, and do not stain in the whites. Under-exposure requires longer development and there is consequently more chance for stain, while over-exposure tends toward greenish blacks and flatness.

If some stains show in the whites, don't throw away the print—it can be perfectly cleaned when fully dry by carefully rubbing the stains with a clean muslin rag wet with wood alcohol; and when I haven't the latter, I find my handkerchief and a little water or saliva does exactly the same thing.

The "special glossy" Velox is intended, by an extended exposure, to give upon a different development and toning the ordinary purple tones; but I have not worked it this way because the beautiful bluish-black tones obtained by the simple treatment are quite satisfactory. The especial use of this form to me is its tendency to give more contrast, so that from a comparatively flat negative a bright print may be obtained.

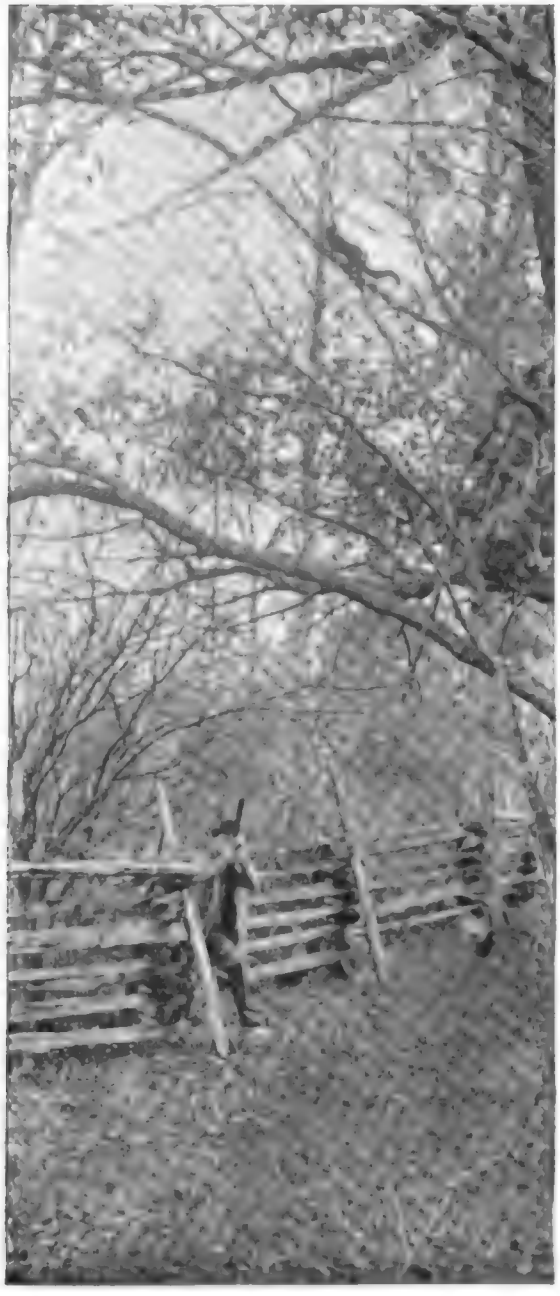
From the developer the print is thrown directly, without washing, into a strong "hypo-alum" bath, made up with sodium sulphite, alum and acetic acid. This fixes and hardens the prints, and must be kept acid by adding acetic acid from time to time. Prints may remain in this bath five to twenty minutes, after which an hour's washing leaves them ready to mount.

They may be reduced, with some loss of richness, in an ordinary reducing bath, and, likewise, weak prints may be intensified and changed in color to rich brown shades by using the two-solution bath known as "Abney's Intensifier." Wash very thoroughly between the baths.

A recent experiment illustrates the value

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of this paper. The Pennsylvania capitol building was burned February 2d. I found among my "glass" a fine negative of the building made a few months ago, which promptly assumed importance when it was discovered that my daughter could greatly augment a missionary collection by the sale of prints. These prints had to be made and mounted nights, and when it is noted that in three hours of one evening I have made 36 good prints from this negative, prints which have been taken as on "aristo platino paper," my regard for Velox may be understood. I repeat, too, that this work was all done in plenty of light, the Welsbach being simply shaded from the developing tray and printing frame while changing paper, and the printing frame being freely held up to the light while placing the paper on the negative.



"DEAD EASY" BY J. A. GRANT

BLUE-PRINT SOLUTION WILL KEEP. BY PROF. CHARLES F. HIMES, Ph.D.

THE blue-print process is so well adapted by its simplicity and cheapness to so many printing demands on a small scale, outside of its more extensive applications, that the frequent references to it in photographic periodicals is readily accounted for. In almost every case, to quote from a quite recent one, *Photographic News*, 1896, p. 599, PHOTOGRAPHIC TIMES, February, 1897, the statement is made, or implied, that: "The mixed solution will not keep." Such absence of keeping qualities in the sensitizing solution, in connection with want of keeping quality in the sensitized paper, would render the process troublesome and wasteful for amateurs and others, who may only desire to use it at long intervals, and in small quantities at a time. For the encouragement of such, the writer would simply say, that in the employment of the process for many years in the laboratory in instruction and in use, the practice has been to make up the sensitizing solution without any reference to immediate use, as a stock solution, and that equally as good results have been obtained with solutions more than a year old, as with those freshly prepared.

Success is not so much dependent upon the proportions of the ingredients, for the process allows considerable latitude in this respect, and the formulæ given for general use vary somewhat; nor does it require chemically pure material, that sold by druggists generally being of the requisite purity; but it does require carefulness in the preparation and use. The writer has found the following a good formula for general use:

1. Ferricyanide of potassium 60 grains
 Water (distilled or rain) by measure 6 drachms
2. Ammonio-citrate of iron 60 grains
 Water (distilled or rain) by measure 4 drachms

The two solutions should be thoroughly made before mixing, and are most conveniently mixed in the bottle in which the mixed solution is to be kept. This should be well-corked, and kept

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THE POACHER BY FERDINAND COSTE

excluded from the daylight by wrapping in heavy yellow paper or otherwise. An opaque bottle, —an earthenware bottle such as used for ink—will be found very convenient. The solutions may be made and mixed in subdued daylight, or gaslight. If required for immediate use the freshly mixed solution will generally require filtration through filter-paper, as the solution must be perfectly clear. Any smudginess apparent on brushing the first piece of paper indicates an unallowable turbidity of the solution, for which filtration will be found an invariable remedy. Filtration, as well as the senistizing of the paper, should be conducted in gaslight. Only as much solution, however, as may be required at the time need be filtered, and any unused portion of filtered solution may be returned to the bottle. As the solution is unimpaired by keeping, filtration may be avoided by making up the solution several days before it is needed, and allowing it to settle in the bottle, when, with care, as much clear solution as may be needed at any time can be poured out. Whilst exposure even to diffused daylight will cause deterioration of the mixed solution, and it to be carefully avoided, solutions that may have become turbid from this cause, are not necessarily worthless, but, if the action of the light has not been too prolonged, may upon filtration afford a usable solution.

This permanence of blue-print solution is a fact doubtless well known to those who have occasion to use it frequently, and attention has been called to it, but the erroneous statement alluded to has a wonderful persistency in photographic literature.

As to the keeping quality of the paper, it is dependent upon a variety of conditions, among them the character of the paper, the atmosphere in which it is dried and preserved some ingredients added to the solution, etc., but freshly prepared paper, not more than a few days old, alone is most certain to give the best results. Even the excellent prepared blue-print papers in the market are best when fresh. As they can readily be obtained in good condition, and at reasonable price, their use may be found more convenient in many cases than the preparation of the paper, but there are times when the size of the paper desired may determine the preparation rather than the purchase, or where unavoidable delay in obtaining the commercial article might necessitate its preparation. With the solution always ready the preparation of even a single piece of paper is a matter of little trouble.

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"THE RIVER WALL"

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INWARD BOUND

BY LIONEL C. BENNETT

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AN EXPERIMENT ILLUSTRATIVE OF THE ADVANTAGE OF TWO EYES IN THE PERCEPTION OF DISTANCE AND RELIEF. BY PROFESSOR CHARLES F. HIMES, PH. D.

A VERY simple experiment frequently presents a generally recognized fact so effectively that a new and more persistent interest is awakened in it. The accompanying illustration exhibits such an experiment, easily performed before a small company, or a class, which emphasizes the peculiar advantage of vision with two eyes in the determination of distance, and in the consequent perception of solidity and form. This fact, highly interesting in itself, apart from any application, has a special interest as the fundamental fact underlying the stereoscope, and is sometimes provokingly lost sight of by individuals with normal eyes, who will insist, whilst looking at a choice collection of stereographs, that they can see them just as well with one eye as with both, and will persist in closing one eye whilst using the instrument.



FIG. 1.

But even those, who readily admit, and perhaps explain, the fact that with two eyes we receive an impression of form and relief with a certainty impossible with one eye, often experience a pleasant surprise upon trying some simple experiment, such as the illustration suggests, or, at least, enjoy the surprise of others, who may test their vision with two eyes for the first time in this way.

In connection with the illustration the following description of the experiment is all that will be necessary to repeat it. Let two persons arrange themselves in two chairs facing each other, about an arm's length apart, each supplied with a small rod; a full length lead pencil will answer. Let one (on the right in the illustration), hold up a newspaper, or other screen, with one hand, and with the other hand hold the pencil vertically, with its top an inch or two higher than the screen, and at such a distance as to be within easy reach of the person opposite. Let the other person, *whilst holding the head in a fixed position*, and closing one eye, and holding the pencil vertically, with its lower end at least an inch or two higher than the upper end of that in the hand of the other, move the hand horizontally forward until the end of his pencil seems to him to be exactly above the end of the other pencil, and then bring it down vertically upon it. It will almost invariably happen, that the pencil will be brought down in front of or behind the other, however often the experiment may be repeated, and however the distance of the fixed pencil from the screen may be varied. Now, if the other eye be opened whilst the pencils are in the last position, the difference in position will at once flash out, and the error in estimate of distance with one eye be apparent. But there will be no difficulty in any case, in bringing the ends of the pencils together with both eyes open. If the conditions given are carefully adhered to, success with one eye open is so infrequent, that it may be regarded as accidental, or due to a departure from the conditions given. A very slight movement of the head, for instance, entirely changes the character of the experiment, by introducing a criterion very similar to that with two eyes. The screen held up between the parties during the experiment, is simply intended to prevent the accidental introduction of other criteria of distance, more particularly the movement of the arm. Other experiments, almost equally conclusive of this superiority of two eyes in the estimation of distance, will readily suggest themselves. With one eye open, the tips of the index fingers at arms' length, cannot with certainty be brought together nor can a candle be snuffed, etc. Indeed in many cases we find ourselves almost embarrassed by a feeling of loss of clear vision, where we are not able to bring both eyes to bear on

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the same point when its location is the matter to be determined.

The connection of this fact with the stereoscope and stereoscopic photography may be considered at another time.

IMPORTANCE OF MAKING PROGRESS. BY FREDERIC FELIX.

To derive the fullest amount of enjoyment and satisfaction from photography a most important thing is to make progress. When one is sure that each effort is an advance over those previously made, and the work is completely satisfactory for the time being, it is a good indication that one's photographic knowledge is being put to good use. With the past and present thus complete and satisfactory one feels spurred to advancement, and no matter what the fancy may suggest or is recommended by other workers, it can be taken up with a clear conscience and an eager mind.

Photography is not a difficult, distant art—that is, there is nothing required in it so arduous or uninteresting as to repel one by its abstruseness, though, of course, success in it requires some degree of effort and application, like the acquirement of any accomplishment—but while learning to be proficient one is interested and entertained, which changes the work to a pleasure. For this reason it will prove the best thing for anyone who operates a camera, but does not do his own work, to begin to do so at once, and thus gain the information that will reveal all the interesting secrets of the art.

If already advanced in work and a reform in method is contemplated, the very best advice is to begin it at once without another day's delay. Make each day or portion of it that is devoted to photography count for something and the idea of true progress will be carried out. Spring always gives a fresh impetus to amateur work, even though the devotee has lost none of the many excellent opportunities to be found in winter, and it is now an excellent plan to see that everything will be ready to aid in the increased amount of work that will be taken up since its approach. It is such a great aid to have all the appliances, stock, etc., together in one room, closet, or corner of a room, where any particular thing may be selected at a moment's notice, and where each part that acts as a factor in successful work may be properly cared for, to insure freedom from failure when the time comes for its use. See that things are thus together and in good condition, and that will be a step to progress in itself. It will also prove an important means of allowing all the other thoughts for advancement to be carried out without the least inconvenience.

Should one contemplate a change in size or quality of outfit, it is well not to dispose of the old lenses or boxes unless they are really worthless, but it is better to get the new thing desired and keep both, as the old may and very likely will prove advantageous some time. It is seldom an enthusiastic worker could be made to feel he owned too many cameras. To some a suggestion of this kind is hardly necessary, as they consider their cameras of the past or present like friends—something it is well to keep and cherish. Further as to the purchase of new material, especially a box or lens, it is well to use quite a little judgment and investigation to make sure the new thing will fill the requirements for which it is intended, as it is so easy to have disappointments come when it is too late to prevent them.

The chief charm of amateur work is the calm intrepidity with which the devotees, more especially the novices, plunge into new things of each and every description, where a professional would, in many cases, give the new offer no thought or consideration. The amateur is by this fearlessness credited with lacking in proper perception and ability to select only the best of things, but in reality his course is commendable, for without much expenditure he is carrying on instructive experiments, increasing his capacity, and making progress by means of the practical lessons. One may read an entire volume of photographic instructions, but one or two actual experiences are worth more than pages of the best warnings and explanations. One of my first ambitions was to photograph the moon, but on looking on the ground glass I saw the foolishness of my idea; that the advice given by a professional acquaintance was correct, and that I would only succeed in getting a faint streak, if even that much. A Chicago friend of mine was even more progressive than I, and took an instantaneous exposure of the moon soon after he got his camera. Incidents like this, of which many different ones may be recalled, are not, at first thought, allied to progress in the least, but in truth they are so, as they get the worker past the blind experimental stage and advance him to a place where he does things with something like a definite knowl-

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edge as to the results to be expected. It is evident that if foolish first experiments can be of value, those made after an advance in the philosophy and chemistry of the art are each of much more worth and importance.

Watch the photographic magazines closely and try to profit by the many excellent suggestions each number of the leading ones contains. Every one, from novice to gold medalist, may derive benefit from their careful perusal and the subsequent application of the advice given.

ON A NEW INDUSTRIAL APPLICATION OF PROFESSOR ROENTGEN'S X-RAYS.

BY ROBERT REYBURN, A. M., M. D., PROFESSOR OF PHYSIOLOGY, MEDICAL DEPARTMENT, HOWARD UNIVERSITY, WASHINGTON, D. C.

The writer has been profoundly interested in the discovery of Professor Roentgen's X rays and has been making many experiments with them. He has recently discovered what he believes to be a new method of utilizing them for industrial purposes, which he will now proceed to describe.

On February 20th, 1897, a number of metallic objects were placed in position for the purpose of taking skiagraphs or radiographs. To those who are not familiar with the process of taking these pictures, it may be necessary to explain that they are taken without any exposure to ordinary light, and no camera, lens or other optical apparatus is used in the making of them.

The X-rays photographic plates are wrapped in two thicknesses of black paper and are placed under the Crooks Tube, in such a position that the X-rays emanating from the tube will strike upon them. The objects to be copied are placed directly upon the black paper covered plates, and on the Crooks Tube being connected with the Electrical Apparatus for a proper length of time the pictures are formed.

It should further be explained that the apparatus used in the making of these skiagraphs or radiographs, was not the ordinary Storage (Galvanic) Battery and Induction Coil, but a a large Toeppler-Holz Induction Electrical Machine made by Waite and Bartlett of New York.

This machine has six twenty-six inch circular glass plates, and gives a spark or electrical discharge between the two poles when in good action of from eight to ten inches.

A very great improvement has lately been introduced into these machines by the addition of Circular Condensers, which equalize the flow



PLATE I.

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of electricity between the positive and the negative poles of the machine, and cause the X-rays (which are known by the greenish light which fills the Crooks Tube) to be steady and uniform.

As above mentioned, a number of mostly metallic objects were placed upon a 6½ x 8½ X-ray negative plate, for the purpose of taking a radiograph or skiagraph of them.

They were exposed to the X-rays for fifteen minutes, and were placed about three and one-half inches distant from the Crooks Tube. Amongst these metallic-bodies was a thin electrotype copy of a coin. See figure 1, plate 1.

To my surprise on developing the photographic plate I found that the design upon the coin, had been as it were driven through by the X-rays, and had been impressed upon the plate, whilst the other objects were chiefly copied in outline. This at once showed that it would be quite possible to copy engraved metallic plates of any kind, metal medallions, etc., by means of the X-rays.

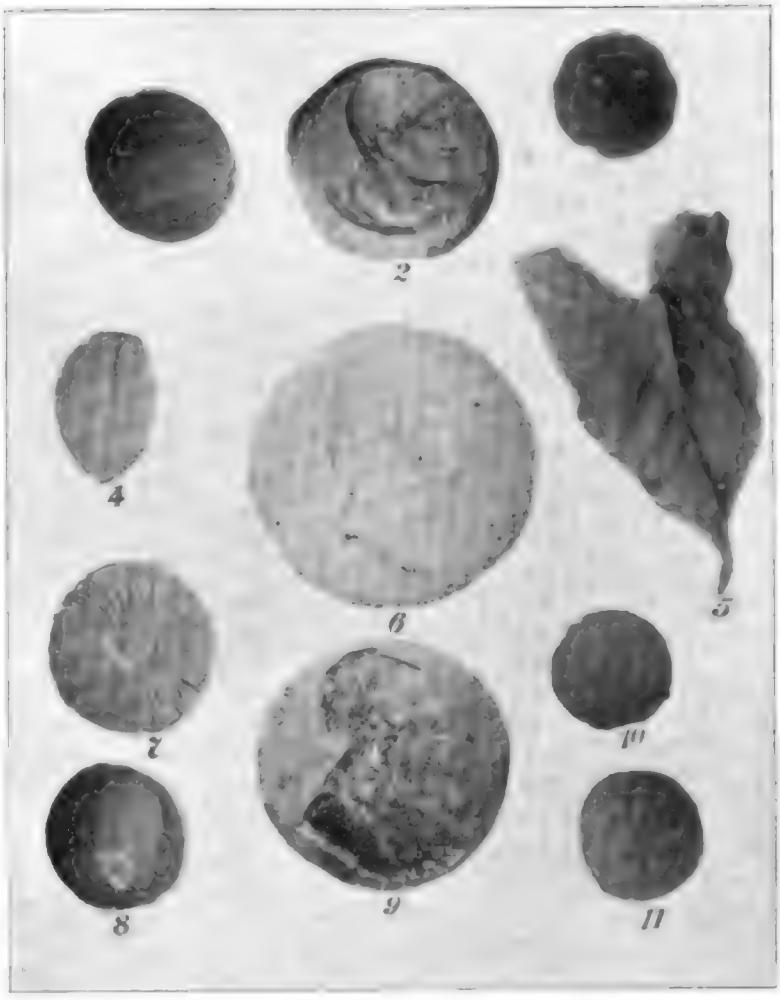


PLATE II.

Farther investigations have confirmed this opinion and accompanying reproductions of the radiographs or skiagraphs taken by me will, I think, conclusively prove the truth of my statements.

Plate 2 gives a much better idea of the process than figure 1, and as will be seen by the reproduction the figures are fairly defined.

In plate 2, Nos. 1, 3, 7, 8, 10, 11, are copper electrotype copies of coins reproduced on photographic plates by the X-rays, Nos. 2, 6, 9, are dittos of copper medallions. Nos. 4, and 5, are similar copies of copper electrotypes of leaves, one being a rose leaf and the other an ivy leaf.

By the way it seems to me to be incorrect to call the pictures described above radiographs or skiagraphs, as they are strictly analogous to photographs taken by the ordinary contact process. I would, therefore, name them X-ray photographs.

What are the requisites for success in making these pictures?

The first of these is that the plates of metal containing the design to be copied shall be thin.

Curiously enough I had on hand quite a number of copies of coins and medallions made by the process of electrotype many years ago. These are of thin copper about twice the thickness of writing paper (say 1/30 to 1/40 of an inch in thickness) and are just right for our present purpose, and copy very well.

It is quite possible, however, I have found, to copy through thicker metal plates than mentioned above, but it entails an inconvenient length of time of exposure. If the time be increased sufficiently, I believe it would be possible for the X-rays to penetrate through metallic plates of almost any thickness.

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The question will, no doubt, be asked by many "Cui Bono"—of what practical use is this discovery? Now, while it is perfectly true that it does not seem at present to be possible to copy engraved metallic plates, etc., cheap enough to make this process a commercial success, yet we cannot tell what may develop in the future.

When it was first discovered that during the the action of a galvanic battery, the copper deposited would perfectly copy any conducting surface on which it was deposited, no one imagined that this little discovery would branch out into an industry that employs thousands of workmen, and necessitates the investment of millions of capital.

So perhaps it may be with the discovery that the X-rays discovered by Professor Roentgen have the power of penetrating sheets of metal and impressing the designs engraved upon them upon photographic plates.

"COMPARISONS ARE ODIOUS." BY E. B.

THE recent illustrated articles on the relative merits of orthochromatic plates, are so confusing, that it seems a wonder why they were written; they do not demonstrate anything.

If any one has any prejudice against any brand of plates, or in favor of any other brand, it is easy to make an apparent demonstration before witnesses that one is good and the other bad, and another experimenter may reverse the decisions of the first, and at the same time both may appear to be honest in their conclusions.

Some makers of dry plates recommend pyro and soda as a developer, another prefers potash, still another says ammonia, and so on with the eikonogen, hydroquinone, metol, and all the various developers alone or in mixtures.

Now if any one of these manufacturers has worked up his emulsions to fit any one of these developers, is it fair to condemn his plates if they do not act the same as another brand that has been adapted to another?

It would simply be injustice to the makers and misleading to the public, who read such articles with a desire to learn.

Even the exposures on several consecutive plates cannot be made accurately if it is done by hand; if done by electric light, the flickerings which occur from time to time will cause variations.

The only fair way is to cut the plates into narrow strips and put a strip of each brand into the holder and expose all at once; and then develop each one according to the formula recommended by the maker, or better still, let each maker develop his own make as he pleases.

Now, after having done so, what is the good of it?

You have only decided which brand in your estimation is quickest, or which develops in the shortest time; if it comes up rapidly it may be uncontrollable for a very large plate; if it comes up very slowly, it may be too tedious for a small plate, so what may be the redeeming quality for one may spoil it for another.

Personally I have gone through with several hundreds of such experiments, but it has never occurred to me to condemn any brand of plates because of a difference in its workings to others, if rapidity is the one thing desired then I would discard all orthochromatic plates that have the dye in the emulsion and prepare my plates with a coloring bath, because, such



THREE OF A KIND BY CARL WOLFF

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EVENING CALM BY LESLIE SELBY

plates will work in half the time that is required for the most rapid plate that is in the market.

If color value is the principal object, then the different plates may require a different color screen, or ray filter, and good and bad results may be made on almost any brand of plates.

There is no doubt but that orthochromatic plates are the best for all around work, but who can say what brand is the best?

MY CAMERA'S OPINION OF ME. BY A. G. ROBINSON.

I SAT in a somewhat drowsy mood, looking lazily into the blaze of the hickory sticks in my fireplace. In one corner of my room stood a tripod camera. The camera itself was wrapped in a focussing cloth. A cord, tied around the cloth at the top of the tripod, contracted its folds and gave the affair the appearance of a massive black head with no body, and a set of spindling legs. All this stood in the range of my vision, though I took no conscious note of it. Suddenly, my far-away thoughts were recalled by a quiet movement on the part of this bodyless creature. A glassy eye, Polyphemus-like, glared at me, and a mouth appeared from somewhere, I do not know where. The mouth indulged in a prodigious yawn, and then I heard the murmur of a voice. There was no doubt about the voice. My hearing is far from acute, and yet I heard the voice very distinctly, in spite of a kind of vagueness regarding its precise locality. The apparition spoke the United States language, as it ought, being of Connecticut birth. I did not move, but waited to see what would happen.

"Thank goodness," it said, "at last he has gone to sleep, and I can stretch my legs a little." That was a mistake. I might have dozed a bit, earlier in the evening, but I was certainly awake then, and quite curious to see what the thing was going to do. First it strode out of the corner and took its position in the clear space on the floor, a little behind me. Then it began a series of performances which would have struck envy to the heart of a Ravel or a Kiralfy. One leg after another was stretched out and moved in the air, in gyrations and manœuvres which must have seemed to me exquisitely ludicrous, but for the anxiety which was also excited for the safety of my black-headed friend. At last it ceased with a deep sigh of relief, which I echoed. It planted itself firmly on its feet, and, had it been able, would have stood with arms akimbo, without doubt. The glassy eye rested upon me. I endeavored to hold myself suitably rigid. I tried to look pleasant. I feared it might go off, though I knew it was not loaded. This effort of mine must have assured the thing that I was not

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asleep as it had at first supposed. It began to talk to me.

"Well, old chap," it said, "you and I have had a jolly lot of pleasant times together." Here it stretched out one of its long shanks and poked me familiarly in the ribs. I nodded. I did not resent the freedom, for I felt that our past acquaintance and our experiences together warranted the liberty. So I just sat still and nodded. "You are not much of a photographer," it continued. I nodded some more. "No, you are no expert, and you are really a very bad amateur. But we have had a lot of fun together, and I just want to talk over old times a little. Perhaps, too, in the course of my talk, I can give you some pointers. All amateurs need them, and you need them very much. I'll say one thing for you, at least. You have given me a chance to see a world of beautiful things. But for you, I never would have been down here in these North Carolina mountains. I'm nothing but a little, cheap 4 x 5 Waterbury, I know, but I've got a mighty sharp eye. You know that, don't you?" I nodded again. "This is surely a great country for pictures, and I am glad to have seen it. Of course there are pictures everywhere, but there are not many places to equal these mountains in point of either variety or beauty. And you have certainly given me an all-round experience such as probably few of my family get. It is true, you have put me at a good deal of work for which I was never intended, but I have always done the best I could for you under all circumstances, and if some of your negatives are as bad as you say they are, it is your fault more than it is mine. I have certainly given you some good pictures, too. Oh! I can usually tell when I am making a good picture. I know whether I am in focus or not, and I know how long I ought to look at a thing, and just how much diaphragm aperture I ought to have. You remember the day we went up Mack Mountain, don't you?" I must have responded with the nod which was evidently expected, though I do not remember it distinctly. But it continued its address. "I made you some good pictures that day. You wanted some fine work and took pains to get it. And let me tell you that there is no short cut to a good picture. You must first really want it, and then do the best you know to get it. Both of us had an awkward job on your first shot on that trip. You had me sprawled out on the slope of a steep hill, until my head was within a foot of the ground, and you had to get down on your back and wriggle under me to get your focus. All I could see was the leafless branches of a tall oak tree, with the blue sky for a background. There was absolutely nothing else that I could see until you began to get me adjusted. Then I saw that you were after those bunches of mistletoe. It was a fine shot for a sixty or seventy foot range, and if your eye had not been so well trained by your microscope, I don't believe you would have made out so well. Then, when we got to the top of the mountain, you wanted me to take the whole of creation. I could see the Balsam Mountains, fifteen miles away in a bee-line, with the valley, and the river, and the little towns between. You should not have done it. It was rather too much for a little chap like me. But I gave the best squint I could, and I have heard you boast of the result. It was a long-range job for a little fellow, and I'm proud of myself for my share in it. Indeed, you have put me at a big variety of work. I've been thankful, many a time, that you have had sense enough to shy portrait work. You have done some, it is true, but you have always put your subject far enough away to give me a chance to draw the picture in something like proper proportions. You have used me for almost everything else—long range and short range. I've looked at mountains that were miles away, and at wild flowers that were only a few inches from me. By the way, I want to tell you that some of that flower work is dreadfully hard. Take that dead-white Trillium, for instance, and the Trailing Arbutus with its waxy blossom. I can get the veined leaves all right enough, but there are no lines in the blossoms that I can work on to get the real effect of them. You ought to have a twin lens camera for that work. I like to do it. It is pretty work, but really it is out of my line. I know I have done some flower work that was really good, though. There is that Yucca Lily picture and some of the Rhododendron plates. In a good many of the wild flowers, of course, I can give no more than a fairly good idea of the botanical structure, but a good many people are interested in even that much. I want you to do more of that sort of thing this summer. Of all the pictures you have made there are none that have interested your friends half as much as your pictures of the wild flowers of the North Carolina mountains. But you must be mighty careful about it. It is a delicate job and takes a lot of patience. I'll back you up as well as I can if you use me, but if you get

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careless, I'll just look cross-eyed and spoil your picture every time. I want you to give me some orthochromatic plates to work on, though. Most of the wild flowers you try are hard enough at the best, but when it comes to yellow Fringed Orchis, and pink Lady's Slipper, and flame colored Azalea, you want just all the help you can get in color values. You have done some very good work on mountain streams, but really, you ought to have an instantaneous shutter. Do you remember that day you took a picture of yourself in your room? I stood there laughing at you for ten minutes. The next minute I feared you would knock my head off. You set me up in the door-way, you know, and fixed your chair by the window. You hung your watch where you could see it without moving your head, and laid your book where you could catch it up quickly. You focused very sharply on the chair, and adjusted your plate holder. Then you looked around to see that all was arranged and ready. I just ached to give you a hint, but I couldn't without tumbling down. You pulled off the cap and jumped to your seat like a flash, and there you sat like a statue, reading your book for ten minutes by your watch. Then you flashed back again with the cap. Your movements were so rapid in both instances that in the limited light of the room, there was no effect on the plate, or wouldn't have been—as you proved later—had you drawn the slide from your plate holder. That was the fun of it. You had not drawn your slide, and I thought, for a second, that my end had come. I expected that you would kick my head off, though I was not to blame. I felt better when you tried it again, and you felt better when you developed that plate and found it to be one of the best things you ever did. Now, there are two or three things I want to say to you. You trail me all over these mountains, carry me over dusty roads, and leave me exposed while that colored man sweeps the room. You ought to brush me out more frequently. Then every now and then you put a plate in your holder with the film inside. That is just carelessness, and—" Thump! I looked up. The camera was in the corner, as usual. A log had rolled from the pile in the fire place and fallen to the floor at my feet. I went to bed and dreamed that I was tramping over a mountain road, with a blazing hickory log stalking beside me on the legs of a jointed tripod. But I was wide-wake when my camera was talking to me.



A VIENNESE BY CHAS SCOLIK

VIEWS—LANDSCAPES. BY JOHN D. ELLIOTT.

THE extreme variety of the examples of views and landscapes given in THE PHOTOGRAPHIC TIMES are all considered to be the very acme of the photographic art. Some are very pleasing and excite admiration and desire of emulation, and others are criticised because they are supposed to be particularly artistic. And, although the extremely artistic examples may please the artist, they fail to please the common every-day amateur photographer.

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An artistic view is generally admired by all who have any artistic instincts, but those who are familiar with the real scene enjoy and admire the amateur's endeavors, because their imagination carries the picture over the adjacent scenery. The popular idea that anyone can take a 4 x 5 camera and go out any time and obtain a collection of superb views without any trouble is not to be combatted. But the photographer and the amateur have long ago learned that the combination of circumstances favorable to a profitable jaunt is about as likely to happen every day as favorable conditions for the amateur astronomer. But even when all the conditions are favorable, patience and judgment are necessary to get the best results. What are we to do when we know that it is impossible to get a truly artistic picture? Set up the camera and take an artistic picture, even if the salient points are away in the background. Undoubtedly, it is better to get the objects desired even if the picture is not strictly artistic.

In the examples enclosed the trees are cut off at the top because the plates were too small, but the objects of interest are clearly shown. The two bridges so close together in the park have puzzled many—one a light, graceful structure; the other, a massive, arched bridge. Utility and art is the answer. The one-span bridge is a fine road bridge; the other conceals in its interior a large water main.

The small bridge over the "river," near the cottage, is at the foot of "Nigger Hill"; and of the thousands of bicyclists who ride over it, few could recognize it from this point of view. The view over the lake needs no explanation; any one who visits Forest Park knows the lake.



FIG. 1.



FIG. 2.

These views were taken with a 10-inch focus, aplanat lens, and a 6½ x 8½ inch camera—all home made—even to the tripod and the *improved* Bain shutter.

And in this place it is pertinent to say that no photograph of any landscape should be taken with a lens of less than 10-inch focus. Of course, on a hand camera and a 4 x 5 plate the distortion is not so obtrusive, on account of the size of the plate. But when the amateur makes a lantern slide of a landscape from a 4 x 5 plate, he is perpetrating a fake on an unsuspecting audience.

But in photography as in music, we are pleased and disappointed in very unexpected cases. We can be sure of improvement if we keep on. We must practice if we are to be successful. And, although we get discouraged, we are only getting able to judge of our own productions, and fortunately able to see our own faults. Communion with one another in clubs and societies will smooth our way; and there are always those who will lend a helping hand, especially professional photographer.

Three-color Projection.—According to M. Marguery, in the *Moniteur de la Photographie*, the positive made in the usual way with bichromated gelatine can be colored with the following solutions. For the red sensation:

Carmine	5 parts
Ammonia	15 parts
Water	100 parts

For the green sensation, a saturated solution of picric acid; for the blue-violet sensation, a ten per cent. solution of methyl violet.

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"A CORRESPONDENT EDITOR WANTED." BY MAX MADDER.

He wore a worried look as he knocked timidly at the door of the editorial *sanctum sanctorum*.

"Come in," said a voice from the interior.

The young man entered, and what a sight met his gaze. There sat the great and mighty editor of the *Photographic Herald*. His massive brow darkened as he gazed upon his visitor, for he hated to be disturbed and was just at that moment engaged in the compilation of a learned article entitled "Can an artist be a photographer or a photographer an artist? if so, which? if not, why not?"

"Well, what is it?" he asked.

"I understand," replied the young man, as he nervously destroyed the brim of his hat, "that you are in need of some one to undertake the answering of your correspondents."

"Do you feel fully qualified?" inquired the editor, as he toyed with a little package of letters that had just arrived.

"I think so," answered the young man. "I once was—"

"Well, we will see," interrupted the editor, "here, for instance, is an 'anxious inquirer' who desires to know how old Daguerre's mother-in-law was when she died."

"I am afraid I could't answer that," faltered the young man.

"Well, here is another," continued the great man. "'Constant reader' wants to know the chemical formula for the new developer, Di-amidonapthalinomonosulphonic acid."

"To decide a bet," continued the editor, reading from another letter he had picked up, "will you please state whether the ferrous oxalate developer is superior to lemonade as a summer beverage or not."

"'A subscriber from the start,' desires to know of a good process for making photographs in natural colors. The process must be an instantaneous one—"

But the young man had fled; and with a weary sigh the editor resumed his writing.

Mr. S. A. Brooke, in his preface to an edition of Turner's "Liber Studiorum," says:—"There is one kind of criticism which is altogether vile; it is that which strives to find out mistakes for the sake of pluming itself on its own cleverness; and rather than fall into that it is better not to get into the habit of blame at all."



BRUSHING UP BY J. A. GRANT

IN THE STUDIO.

"You can say what you like," said the artist; "but you will never convince me that there exists art in photography. The whole process is a purely mechanical one, and, therefore, the photographer is nothing but a machine however you look at him."

"Well! if you take that stand," replied the amateur photographer, getting somewhat riled, "all I can say is that you admit you know nothing about it, for when a man tells me that nothing will convince him to the contrary of his own opinions it becomes apparent on the face of it that he has never taken the trouble to learn."

"Perhaps our friend the artist will try to explain what he means," interposed the professional photographer, anxious to reconciliate the two friends. "What I mean is this, that photography is purely a mechanical process, provided a man has learned to give the correct exposure, understands how to develop his plate, and to make from his resulting negative a satisfactory print—all purely mechanical operations, mind you, then he may be termed a successful photographer."

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SEAWARDS BY SMEDLEY ASTON

"The devil whoops as he whooped of old.
Its clever, but is it art?"

"I rather think," put in the professional with a smile, "that if our friend the artist were in my business he would soon find out that there was at least some art required in getting the customers, and some more still to get them to pay when you had secured them."

"If, as you say," said the amateur, replying to the artist, "the whole process of photography is purely a mechanical one, why is it that some men are so much more successful than others. You think, perhaps, that it is because they have mastered, to a greater extent, the mechanical details. That is true, but to a limited extent only. There is something else, and that is the something that you pretend to ignore the existence of. I refer to the artistic feeling in the man himself. A photographer may be an artist just as much as an artist may be a photographer. Let us take, for instance, the selection of the view. The photographer, who claims to be an artist, will study the rules governing composition as religiously as the artist himself, and he will further so modify his exposure and development (which you consider to be two purely mechanical operations) so as to obtain the most artistic effects of light and shade. We will leave out the question of focus, although that is one of great importance to the artist photographer, and proceed to the making of the print from the negative, for this is what is seen and criticized as the finished result. Do you think that there is no artistic feeling required in the selection of the paper, in the making of the print itself, in the subduing of certain parts and the enhancing the value of others—even in the trimming and mounting of the print?

"I must admit," interposed the artist, "that I had not given much attention to these matters. I grant you I have seen some very fine effects produced by photography, but have always considered them to be the result of chance or accident.

"That is in an idea," replied the amateur, "that is shared by many others besides yourself, including some of the unsuccessful photographers; but did it never strike you, provided your theory was correct, it is a curious fact that *there are certain few who are constantly meeting with these 'accidents.'*"

"I vote we adjourn this discussion," broke in the professional, until we meet again, the artist looks kind of worried, and we will give him a chance to think it over before he replies to what you have said."

Selection of Subject.—It is of first importance that the component parts of composition should convey the unmistakable impression of unity of interest, unity of action, unity of sentiment. If the spectator's attention is subdivided in any way, this indicates that the composition is lacking in unity or in due subordination of parts. A work of art should be one complete thing.—A. P. Note Book.

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THE REAPER BY LAWRENCE J. BRENGLE

THE USE OF VARIOUS IRON SALTS IN PRINTING PROCESSES. BY E. VALENTA.

The preparation of a good iron printing paper presents no difficulties to a practical photographer. It is very simple, and rests on the sensitiveness to light of certain iron salts, of which that most generally used is the ammonio-citrate of iron. This salt, as it is generally used for photographic work, forms shiny brown scales, which are very hygroscopic, and which will not crystallize, and are made by drying on glass or porcelain. The brown ammonio-citrate of iron, when dissolved in the proportion of 10 parts in 40 to 50 parts of water, and mixed with a tolerably concentrated solution of red prussiate of potash, 8 parts in 40 to 50 parts of water, will, if the mixture is not exposed to daylight, and spread on suitable paper and quickly dried, give a printing paper which gives a blue positive when exposed under a line negative, and white lines on a blue ground when exposed behind a tracing.

The paper prepared in this way, which, for the purpose of this experiment, we will call a normal paper, will keep for a fairly long time if protected from light and damp; but its sensitiveness leaves much to be desired. Tests which I have made by the help of a paper scale photometer, the light absorption for each film of which had been very carefully determined, showed that ordinary albumenized paper was from four to five times more sensitive than the above cyanotype paper.

Numerous experiments were undertaken to make the cyanotype paper more sensitive, and the attempts of Fisch, Schnauss, Carey Lea, La Grange, and others were tried. Fisch recommended the use of the tartrate or oxalate instead of the ammonio-citrate of iron, and in both cases, although the sensitiveness was increased, the keeping quality of the paper was lowered.

Experiments were therefore made to increase the keeping power and sensitiveness with the following results :—

(1) Addition of ferric oxalate in 20 per cent. solution, as used in platinotype printing was added to the normal cyanotype solution, and considerably increased the sensitiveness. Large additions make the paper turn blue in drying. The greatest addition of ferric oxalate permissible is 1 ccm. to 20 ccm. of cyanotype solution, and even with this the paper turns a faint greenish blue in drying.

Practically the highest addition that can be recommended is 1 to 2 ccm. to 80 to 100 ccm. of the sensitizing solution. The increase of sensitiveness in this case was always from there to four times, whilst with an addition of 1 to 20 the time of printing was reduced to one-sixth,

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but no pure whites were obtained in the print. The keeping power of the paper was not sensibly reduced by this addition.

(2) Additions of double salts of iron, such as potassium, sodium, and ammonium ferric oxalates.

The sensitiveness attained by adding equivalent quantities of these salts to the same quantity of ferridcyanide of potassium gave the ratio of 8 : 11 : 20, the ammonium salt being the highest. Additions of this salt to the normal cyanotype solution act very favorably in increasing the sensitiveness of the paper, and affected only to a slight degree the keeping property.

(3) The double salts which ferric citrate forms with ammonium citrate were examined by Rother, and he describes as neutral ammonio-citrate of iron, a green salt which has the formula $FeC_6H_8O_7(NH_4)_3C_6H_8O_7$, which consists of small scales soluble in water with a yellowish green color.

Besides this salt, Rother also describes two acid salts, the composition of which is $FeC_6H_8O_7(NH_4)_2C_6H_6O_7$ and $FeC_6H_8O_7(NH_4)C_6H_7O_7$. These salts also form green scales which dissolve in water with a green color like the neutral salt. The solutions of these salts mixed with ammonia turn brown, and on addition of citric acid only slowly turn green.

The brown ammonio-citrate of iron which is generally used by photographers for the cyanotype process, and which has already been described, does not correspond, so far as the proportion of iron which it contains, with any of these salts, but corresponds, as I proved, with the green salt which is prepared by J. Merk, of Darmstadt.

Comparative experiments which I instituted on the action of the brown and green salts, as they occur commercially, gave results which are decidedly in favor of the use of the green salt, and I therefore analyzed these two salts. The preparations I used were of German make.

If one takes into consideration the two salts as regards their proportion of iron, the formula given at the commencement of this article for preparation of a cyanotype paper with the "brown salt," must be modified for the green salt, and 7-7 of this must be substituted for 10 parts of the brown. On the other hand, reckoned on the equivalent quantity of iron, 10 parts of the brown, 13-5 parts of the green salts correspond to 100 parts of water and 8 parts of red prussiate of potash.

In the one as in the other case, a considerable increase of the sensitiveness or shortening of the time of the printing can be detected, but in both cases with the green salt blue fog appears and the prints are not clean. This disadvantage can easily be obviated by lowering the proportion of prussiate in the sensitizing solution.

The following mixture proved to be the most advantageous :—

Solution A.

Green ammonio-citrate of iron.....12-5 gr.
Water 50 ccm.

Solution B.

Red prussiate of potash..... 4-5 gr.
Water 50 ccm.

A very good paper is obtained by mixing the two solutions and spreading on paper, and from photometer experiments it is eight times as sensitive as the paper prepared according to the formula with the brown salt, given at the commencement of this paper. As regards the keeping power, the mixed sensitizing solutions, when kept in opaque glass bottles, keep better than that prepared with the brown salt, and the prepared paper, so far as my observations have gone, appears to keep as well.

Experiments with regard to this require really a longer time of observation, and further experiments will be made. In any case, the advantage of higher sensitiveness of the paper and the great vigor and brilliancy of the prints have proved the superiority of the green salt over the brown for cyanotype papers.—*Abstract from Photo. Corresp. Translated in Photo. News.*

A recent issue of the *British Journal* contains a clever skit entitled "Jones *versus* the members of the Linked Ring." The defendents were charged with holding an exhibition and selling "things thereat alleged to be photographs." An analysis of them showed they were adulterated to a large extent with other matter, including brown paper, brush work, etc. Council for the defence pleaded that the members of the Linked Ring were "high-minded gentlemen who he should show were subject to delusions. Some believed themselves to be gifted writers, all entertained the idea that they were real artists." Ultimately, the jury, "without retiring, intimated that they were satisfied that the defendants were subject to delusions," and His Honor dismissed the case, but declined to make any order as to costs.

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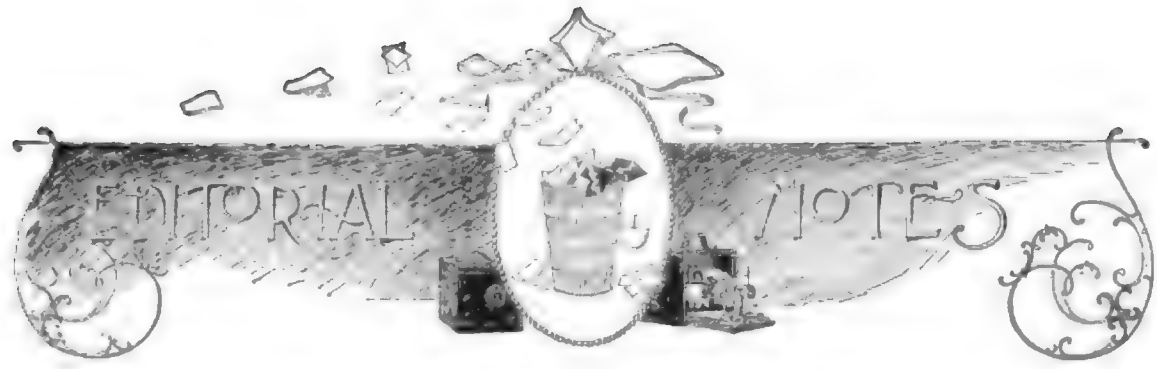
DINER À LA CARTE

BY JAS. A. SINCLAIR

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In our last issue we published an interesting article on night photography by Mr. Wm. A. Fraser, and in order to encourage others to attempt this branch of our art, we offer a silver and bronze medal for the best and second best photograph taken at night. The competition is open to all. No coupons are necessary. It is, of course, understood that the negative and print are both the work of the competitor. The name and address of the competitor must be written on the back of each picture entered. The competition will close on the last day of this month. We reserve the right to publish a reproduction of any of the pictures entered.

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From time to time we have warned our readers against purchasing cheap and unreliable flash powders. The following paragraph from the *Chicago Record* will possibly make more impression than any mere warning from us.

"Flash Light Powder Explodes.—Exploding flash light powder in James H. Smith's photograph supply house, on the sixth floor at 311 Wabash avenue, at 5 o'clock yesterday afternoon, resulted in serious burns to one man and considerable damage to windows and wooden partitions throughout that part of the building. The concussion broke front windows more than 100 feet away in another apartment and sent a shower of small glass upon passing pedestrians in Wabash avenue. The blaze which followed was soon extinguished. The only person injured was R. J. Smith, a brother of the proprietor, who was putting up packages of the powder in the shipping and store room. Friction of the grains as he handled them is supposed to have caused the explosion. Smith was badly burned about the face and hands and was removed to St. Luke's Hospital. He is married and lives at 3338 State street. All the windows in the storeroom were blown out, as well as those across a narrow court and some on lower floors. The wooden partition shutting off the general office and salesroom was also shattered."

This flash light powder has been advertised as cheap and safe—cheap it certainly was, but its safety apparently a fiction although we are glad to learn that the firm has altered their formula and now manufacture a powder which they claim as safe as any on the market. Speaking of the safety of magnesium flash light powders, we are always reminded of the late Dr. Ehrmann. He was demonstrating to a number of witnesses the safety of the Scovill flash light powder. "Gentlemen," he said, "I claim for this powder that it is non-poisonous and non-explosive. To prove that it is non-poisonous I will eat a spoonful of it." He suited the action to the word. "To prove that it is non-explosive I have here a large hammer which I——"

He had raised the hammer in the air, but at sight of it the whole audience fled for the stairs. But before any of them could get away the hammer had descended with a terrific blow, breaking open the cartridge but otherwise doing no harm. The audience, reassured, returned looking rather foolish, but with considerable confidence in the non-explosibility of the powder.

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Our esteemed contemporary, *Photography*, having persistently condemned everything American, will have a bitter pill to swallow when it reads the awards at the Society of India's exhibition, at Calcutta. The special gold medal for the best picture in the exhibition was awarded to Miss E. V. Clarkson, of Potsdam, N. Y. The gold medal for portraiture was secured by Mr. Alfred Stieglitz. For lantern slides two awards were made—a silver and a bronze medal. Mr. Charles Simpson won the first and Mr. W. A. Fraser the second. Among the highly commended are included the names of C. R. Pancoast, R. L. Bracklow, Clarence B. Moore, and E. L. Ferguson. It must be very satisfactory to the Camera Club of New York to note that all the medalled American exhibors are members of that society.

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It is a *bona fide* fact that within the past two years the paid circulation of this magazine has more than doubled itself. The editor is a young man, and with the eager desires of youth it was his intention to keep up the same ratio

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of advancement until he retired—say at eighty; but alas! his hopes have been sadly shattered by the discovery that at the end of that time—or in other words, if the sale of THE PHOTOGRAPHIC TIMES doubled itself every two years, before he retired it would have the respectable circulation of 167,822,555,000 copies per month, or about 115 times the entire population of the world.

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THE fact that formalin, the trade name for a forty per cent. solution of formic aldehyd, will render gelatine insoluble, is now well known to photographers, many of whom employ it for hardening their negatives. Gelatine thus hardened has now been recommended as a substitute for celluloid, possessing all the virtues of that substance, without the vice of inflammability.

According to *The National Druggist*, Schroeder detailed before the recent general assembly of the Netherlands Apothecary Association a cheap and ready method of preparing formalin gelatine without the use of any special apparatus, which we condense as follows: Dissolve any amount of gelatine in an equal amount of water, by the aid of heat. Strain while still hot, and to every 100 parts of the warm solution add 2 parts of formalin, stirring thoroughly in. The mass soon attaches itself to the stirring-rod in a thick, tenacious ball, which is then transferred to a cold capsule and placed in a vessel provided with a tight cover. Formalin is poured over it, the cover closed fast, and the whole allowed to stand awhile. The formalin used for the latter purpose can be used over and over again. After standing, the gelatine is removed and rubbed down to a coarse powder. The latter is thoroughly washed with water, dried, and can now be reduced to the finest powder, which can be used for all the many purposes for which formalin gelatine has of late been found useful. It is essential that the processes here described shall be followed closely, as otherwise difficulties are apt to arise.

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THE new "Camera Club" of New York seems to be running along smoothly and contentedly. We are glad of this—glad of it because, of course, there was a certain section who bitterly opposed the amalgamation of The Society of Amateur Photographers of New York with the New York Camera Club. Of course the opposition came from both sides, but now the discontented and undesirable ones have resigned, and the other opponents to the scheme have shaken hands and declared that it has'nt been such a bad move after all.

We must admit that on entering the rooms of the Club in its present state we sadly miss the cosy little corners, where we used to sit and chat upon all kinds of subjects with the "boys," including photography, of course, occasionally, just to keep in touch with the surrounding, but now *nous avons tout changé*. To accomodate the apparatus and lockers of the Camera Club all the furniture has been scattered about in the different rooms and doesn't look comfortable any more, although we must admit that the change will undoubtedly be beneficial to the workers. We were only the idlers, and now as we enter and find, instead of the comfortable writing tables and sofa in the background, a battery of enlarging and reducing cameras, our heart sinks and we turn away in despair to look for a seat. We find an empty negative box, which answers the purpose, and there we sit gazing in a vacant way at the busy bees opposite.

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TO MAKE photographs with all the glorious colors of nature has long been the dream of the photographer. This is not an original remark we admit, but we have recently been viewing a poster exhibition, and after a nightmare of purple grass, blue houses, and green skies, we feel that it would be a relief to see some pictures of Nature as she is, and not as the poster artists think she should be.

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NO MUSIC-HALL entertainment is considered complete now-a-days without its living photographs. They have taken the place of the living pictures, to supply the popular demand for something novel. The possibilities of photography have never been better brought before the public. Unfortunately the results at present shown are far from perfect although, considering the many difficulties to be overcome, the inventors of the various machines have certainly succeeded very well so far, and we can hope for improvements very shortly. It appears to us that the pictures used for projection are far too small for the purpose. Edison, for instance, uses the same films for projection as were originally made for the Kinetoscope. These are a little more than an inch in diameter, and when enlarged many hundred times on the screen all the defects are magnified to such proportions as to sadly mar the result, and

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SUNSET AFTER STORM BY REV. A. H. BLAKE

these defects increase as the film is used, becoming scratched and chipped by the machinery, and are the cause of those flashes of white light which make their appearance in the projected pieture. Some more transparent substance than celluloid must also be used for the films, and the person who will invent this will confer a boon on the chronophotographer.

* * * * *

Mr. W. I. Lincoln Adams, President of the Scovill & Adams Company, of New York, and formerly, for several years, Editor and Manager of this magazine, writes as follows in regard to our editorial note on the subject of washing negatives in pure ocean water, which appeared on page 197 of the April number of The Photographic Times:

"You say 'there is no reason why pure ocean water should not be employed for washing plates,' provided the film be eventually rinsed in fresh water. My experience leads me to advise the use of the fresh water *first*, and dispense with the sea water altogether! I tried washing some plates once in sea water with very unfortunate results, which I will report to you for whatever they may be worth.

"We had been making 'snap' shots all day at the New York yachts at anchor in the harbor of Vineyard Haven, Martha's Vineyard, under the most favorable conditions, and had reason to expect some good results. We ran across Vineyard Sound in the evening and anchored for the night in the little harbor of Quisset, off Buzzard's Bay, and while on the yacht proceeded to develop our day's exposures. The results were entirely satisfactory until, being tempted by the fact that our water supply was running low, to try sea water for washing the plates, I had a pail of water brought to me, in our improvised dark room, for washing the remaining negatives. No sooner was the first one immersed in the salt sea water than innumerable blotches and bubbles appeared all over it on the film; a second and third plate treated in the same way came from the sea water with the same results, and the most careful washing in fresh water afterwards failed to overcome them.

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The negatives were carefully dried, but the blotches remained and, of course, ruined the plates.

"Now, I did not understand at the time just why this effect should be produced by the sea water, nor do I now. I should think, as Dr. Stebbins suggests, that the salt water might act as a hypo-eliminator and not be a bad thing in itself. Perhaps Dr. Stebbins will explain the chemistry of the results which I have mentioned. If so, I shall be very glad to hear from him."

* * * * *

The *Photographic News* contains the following paragraph:

"American Patents.—A correspondent of a contemporary gives some particulars of the American patent system which show in what respects it has the advantages of our own. It appears that all American patents live seventeen years, and, before sealing, have every trace of old matter struck out of them by official examiners, to prevent their being dragged into law courts and upset. The validity thus given to patents induces bankers to lend money on patented inventions of merit to get them worked out and brought into general use. The public are in favor of taking up patented inventions because they are new. Capitalists willingly agree to inventors having a half-share of profits. Inventors try to excel their previous efforts, resulting in "mature invention," which yields the most valuable results for the public. Pirating and repatenting poor men's inventions is not tolerated in America. We agree with the writer of the letter that, if inventors, patent agents, and the public knew their true interest in this matter, they would be heart and soul in favor of getting the American patent system adopted here in place of our own."

Unfortunately these statements are not facts, a patent in this country costs much more than in England, and while the British Patent Office makes no claim to secure the patentee, the authorities in the United states do make a pretense of this, the result being that the unfortunate inventor often imagines with his patent secured he is safe from the law courts, but the number of lawsuits on account of patents is, we wager, as great in this country as in England. To make a thorough and conscientious search to prove the validity of a claim would take an able man many days. The men intrusted with this duty are, we believe, supposed to attend to at least a dozen a day, and these men are mostly incompetent. We have many instances in our mind proving this, and we believe it is a fact that a knowledge of any subject is not necessary to become an assistant examiner. Thus a man may to-day be in charge of the photographic department and required to decide on photographic claims, and to-morrow may be transferred to the agricultural or any other department. Of what use is such a search unless made by some man well versed in all the inventions that have already been taken out.

* * * * *

It is quite possible to make clear and sharp pictures of trees on a windy day if you set about it the right way. Use a shutter working at say half a second. On the most windy day the trees are rarely moving all the time. There will be intervals, periods of a few seconds only, when the branches and leaves are practically still. These must be waited for, and an exposure secured each time. Thus, if three seconds exposure is required, the shutter must be snapped six times, giving half a second each time. Care must be taken that in resetting the shutter the position of the camera is not altered. On a windy day it is well to tie a piece of string to the center of the tripod and attach a large stone near the ground.

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A humorous contributor to the pages of *The Photographic News* and who goes by the unpronounceable name of DJBTX, says:

"The Americans have always a keen sense of the proper grouping of things, hence I am not surprised to read that the Republican members of the Ways and Means Committee, now drafting the new Tariff Bill, "have restored paintings, statuary, and sausages to the dutiable list, fixing each at 25 per cent. of their *ad valorem* value." This association is unimpeachable, for no one can deny that the mysterious compound known as a sausage is not a work of art."

* * * * *

Be original, be unique if you can, but not out of harmony, says H. P. Robinson. Individuality goes wrong when it is out of harmony with its surroundings. Eccentricity is very easy, but it does not last. It is open to the meanest capacity and is often assumed by it; but genius to be useful should consist of individuality backed by its suitability to its environments.

Photography would be better if its elements were not so easily comprehended as to make it almost a frivolous pursuit.

It would be a paradox, I suppose, to say that the art is so easy that it is exceedingly difficult; but I cannot help attributing much of our mediocrity to our extraordinary facilities. I become more convinced every day that the cause of so little good work being done, and the swamping of that little by so much bad, is the constant clearing away from the processes of those blessings in disguise difficulties.

Difficulties may sometimes perplex and overpower, but when ease in any pursuit comes in endeavor flags and emulation ceases.—*H. P. Robinson.*

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Mr. J. A. Sinclair, F.R.P.S., recently gave a demonstration before the Brixton and Clapham Camera Club, and said that the bad weather was responsible for difficulty in printing the tissue intended for demonstrating the process, stating that the whole day's printing had only registered one-half tint on the actinometer. He had exposed for an additional hour to the incandescent gaslight, and this had accomplished more than the whole exposure to what should have been daylight. Under these circumstances he expected but poor results, but he would develop as usual, and explain the process.

Artigue tissue is a white paper coated on one side with a very thin almost transparent, black pigment, and presents a fine matt appearance. The paper is supplied insensitive, and must be sensitized by immersing for two minutes in a 2 per cent. solution of bichromate of potash. Air-bubbles are not likely to form, but if they do so remove by lifting the tissue and re-immersing; on no account touch the tender surface with the finger. The temperature of the sensitizing bath must not exceed 60 deg., or the pigment washes away. The longer the immersion the greater the contrast in printing. At this time of year no difficulty exists in drying; if sensitized at night, and suspended in the dark room, the tissue is dry and ready for use in the morning; but in summer the drying room must be kept cool with ice; if too warm the tissue seems to partly dry, then to tear away in streaks and melt. The sensitised paper only keeps a week or two, and is best used the day after being prepared, or development is more difficult. In printing, place coated side in contact with negative, using an actinometer to judge the exposure. The tissue is about three times as rapid as silver paper.



MODESTY PERSONIFIED BY J. DE BRUYN KOPS

To develop, the print is immersed in warm water until an outline of the image appears, with proper printing 10 to 15 seconds, and fastened at the edges by clips on to a piece of glass or opal, and then placed for a few minutes in cold water. To complete development a mixture of fine sawdust (specially prepared by Artigue) and water is made to about the consistency of pea-soup and heated to from 64 deg. to 70 deg. The print, on its glass support, is held over the bowl containing the sawdust-soup, some of which is poured along the top edge so as to run evenly over the whole surface of the print, acting as a fine file and removing the soluble pigment along with it. The print is now and then rinsed in cold water to see the progress of development, which as the image gains strength in drying, is carried on further than seems necessary. Considerable control over results can be obtained. Cool developer, thick solution, and under-exposure tend to soft gray tones; hot developer, thin solution, and over-exposure to blacks and brilliancy. With correct printing development is regular and even. It is best to commence with thick developer and work to thin. If under-printed, start development at 80 deg. to 90 deg., but too warm solution dissolves everything from the paper. If much over printed, soak for half an hour in cold water before development. The sawdust can be used repeatedly for six months or so. When developed wash the print in cold water, and then place for 10 or 15 minutes in a 5 per cent. solution of alum to harden the surface, and to remove all traces of bichromate from the paper. Drying, trimming, and mounting are carried out as usual.

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In answer to questions Mr. Sinclair said the tissue could not be got ready sensitized, and was at present only supplied in engraving black. Good negatives, full of detail and not too dense, are requisite. With certain negatives better results can be got than with any other process. No special care is required in development, but the paper is very delicate and must not be fingered. Printing does not continue between exposure and development as with ordinary carbon tissue.

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HYPO ESTIMATION—A PRACTICAL NOTE.

BY REV. F. C. LAMBERT, M.A.

To the ordinary photographer one of the most important, practical, and frequent questions runs somewhat thus "Is this plate or print sufficiently washed?" The following note is an attempt at a contribution towards a reply. The complete answer involves at least two points—*first*, what is the minimum quantity of hypo permissible; *second*, is the quantity left in the print above or below this limit.

In parenthesis we may remark that from one point of view it is true to say that a piece of paper that has once been soaked in a solution of hypo is never absolutely free. For suppose the original strength to be 1 in 10, and that five minutes in running water reduces this one-fourth, *i.e.*, at the end of the first five minutes there remains in the print a solution of strength $\frac{1}{4}$ of $\frac{1}{10}$, *i.e.*, $\frac{1}{40}$. At the end of a similar interval this would again be diluted to $\frac{1}{4}$ of $\frac{1}{40}$, *i.e.*, $\frac{1}{160}$, and so on. Thus, at the end of, say, a dozen such intervals, we should have left a very dilute solution, but still not an absolute exhaustion. Practically, however, we find that a point is reached when the amount of hypo left with us becomes a negligible quantity. What this proportion is, this paper does not attempt to discuss. We merely suggest a rough and ready way of forming something like a fairly correct guess at the question, is the strength of the hypo in the washing water above or below a certain point? For example, we may be able to say with tolerable certainty that the strength of hypo is, say, *above* or *below* one in ten thousand, but we shall not be able to assert with any confidence *how much* above or below that strength our solution is.

Throughout the experiment tap water was used for the test reagents, and also for the solutions of hypo. The conditions are thus fairly comparable to ordinary practice, as few, if any, workers use distilled water for plate or print washing.

The following solutions of ordinary commercial hypo (in tap water) were prepared. Ten grams of hypo were weighed and dissolved in a small quantity of water and made up to 100 cubic centimeters. This solution was marked No. 1 (1 in 10). Of this, 10 c.c. were taken and diluted with 90 c.c. of the water. This obviously was again one-tenth the strength of No. 1. This was marked No. 2 (1 in 100). In a similar way we made No. 3 (1 in 1000), No. 4 (1 in 10,000), No. 5 (1 in 100,000), and No. 6 (1 in 1,000,000).

The first series of experiments was by the nitrate of silver method. In this case we dissolved 5 grams of silver nitrate in 100 c.c. of water, and allowed the milkiness due to the impurities in the tap water to subside.

1. In a small test tube about 3 c.c. of the silver solution was taken and an equal quantity of hypo No. 1 ($\frac{1}{10}$) added. Result, a dense white precipitate turning brown and black.

2. The last experiment was repeated, but order reversed, *i.e.*, the silver was added drop by drop to the hypo—forming a white precipitate which was quickly redissolved in the hypo. An excess of silver produces a permanent precipitate turning brown and black, but soluble on addition of more hypo.

3. First experiment repeated, using No. 2 hypo ($\frac{1}{100}$). Hypo added to silver again gives dense white precipitate, changing to yellow, orange, brown, black.

4. Hypo ($\frac{1}{100}$) is taken and silver added drop by drop forming white precipitate which redissolves. More silver gives a precipitate which does not redissolve, but slowly changes color. (Change of color is hastened by heating).

5. Hypo No. 3 ($\frac{1}{1000}$) added to silver forming yellow color, changing to brown and black.

6. Silver added drop by drop to hypo ($\frac{1}{1000}$). One drop gives a cloudiness which changes to orange and black.

7. Hypo No. 4 ($\frac{1}{10000}$) is added to silver, giving pale yellow solution, which darkens on heating, forming slight precipitate.

8. Silver added to hypo No. 4. Three drops give pale yellow precipitate, turning orange and finally black.

9. Hypo No. 5 ($\frac{1}{100000}$) added to silver a slight opalescence with tendency to a very slight yellow tinge.

10. Hypo No. 6 ($\frac{1}{1000000}$) and silver were mixed in various proportions and orders, resulting in a slight white cloudiness soluble on the addition of a drop of dilute ammonia. This clear fluid perhaps showed a suspicion of yellow tinge, but this was *very* doubtful.

In the next series of experiments we used mercury bichloride (perchloride), a saturated solution in tap water being employed. In each case the hypo solution was added to the test solution, about equal bulk.

11. Hypo $\frac{1}{10}$ to test yielded dense white precipitate.
12. Hypo $\frac{1}{100}$ to test yielded dense white precipitate.
13. Hypo $\frac{1}{1000}$ to test yielded much less precipitate.
14. Hypo $\frac{1}{10000}$ to test yielded slight opalescence.
15. Hypo $\frac{1}{100000}$ to test yielded very slight opalescence.

In the last case the opalescence could only be seen when the bulk of solution was about an inch or more deep, and then only in certain lights against a black cloth background.

For the next series of experiments we prepared a weak solution of white starch by boiling it in water for a few moments. A few drops of a saturated solution of potasium iodide are added when the starch solution is quite cold. One drop of an alcoholic solution of iodine is now added, yielding the well-known rich blue color (of starch iodide possibly). Two test tubes of equal size, same color (of starch iodide possibly). Two test tubes of equal size, same color, etc., are now taken, and into each equal quantities of the standard starch solution are put. In the first tube we add an equal bulk of tap water, to the second tube we add a like quantity of the various solutions of hypo. With the following results

16. Hypo $\frac{1}{10}$, color instantly discharged.
17. Hypo $\frac{1}{100}$, color instantly discharged.
18. Hypo $\frac{1}{1000}$, color quickly discharged.
19. Hypo $\frac{1}{10000}$, color slowly discharged.
20. Hypo $\frac{1}{100000}$, color slowly, and after shaking showing a slight change.
21. Hypo $\frac{1}{1000000}$, color little or no change as compared with the companion tube.

A moment's thought will show the reason for using two tubes and diluting one with plain tap water and the other with an equal quantity of hypo solution. If we did not reduce the coloring matter to the same degree of dilution in both tubes it would not be possible to estimate how much color change was produced by the hypo and how much was due to the mere addition of water.

The last series of tests was by the potassium permanganate method. The standard solution was prepared

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thus: Potassium permanganate, 1 gram (1 decigram); water, 90 c.c.; when dissolved add potassium hydrate (caustic potash), 2 grams, and dilute to 100 c.c. This being a color test the last-mentioned (starch) method was used, *viz.*, two tubes, one diluted with water and the other with the hypo solutions. The standard mixture was diluted in bulk so as to give in a half-inch test tube a pale (wild-rose petal) pink.

The following were the results:

22. Hypo $\frac{1}{10}$, a pale green color.
23. Hypo $\frac{1}{100}$, a pale green color.
24. Hypo $\frac{1}{1000}$, a pale yellowish green.
25. Hypo $\frac{1}{10000}$, a pale yellow color.
26. Hypo $\frac{1}{100000}$, a slow change to pale yellow and on to dilute black.
27. Hypo $\frac{1}{1000000}$, little or no change.

Thus, on the whole, the two-color (starch and permanganate) tests seemed best, but they failed at about the same point, *i.e.*, between the $\frac{1}{1000000}$ and $\frac{1}{100000}$ strengths.

Next we took equal quantities of these last two solutions, yielding $\frac{1}{2000000}$ strength. And testing it by the starch and also by the permanganate method we got practically the same degree of sensitiveness with both tests. Other considerations may be mentioned, *e.g.*, starch does not keep well in solution, and the change of the nature of a dilution, *i.e.*, from deep to pale blue or colorless. Whereas in the permangante test the change is a change of tint from pink to green or pale yellow. This is more easily seen in the daylight. At the same time the permanganate solution tends to change by the mere contact with air. Therefere it is necessary to shake both the test tubes for an equal time, so that the color change due to air may be equal in both tubes.

Practically then it becomes comparatively a simple matter to know whether the washing water contains more or less than one part of hypo in 100,000 of water, but beyond, *i.e.*, below this strength, one cannot place any great reliance on the foregoing tests. It should be carefully noted that we say in the *washing water*, and do not necessarily imply that this is at all times the same thing as saying *in the plate or print*. If, however, the print or plate be allowed to soak for some little time, film downwards, and towards the top rather than the bottom of the soaking water, it seems highly probable that the strength of hypo in the washing water, under these conditions, is likely to be approximately that of the water contained in the paper or gelatine, etc.

[It may be useful to give some approximate idea of what $\frac{1}{100000}$ means. It is *roughly* equivalent to one ounce of hypo dissolved in about 39 casks of water, each holding 16 gallons.]—*The Practical Photographer*.

THE CRITIC.

He was a meek and simple-looking man,
 But seemed, somehow, to lack decision,
Built on a very ordinary plan,
 And with great obliquity of vision;
That is to say he squinted rather sadly
 His eyes were weak, his nose was very red,
His tailor seemed to treat him badly,
 And all the hair had vanished from his head.

"Expert photographer" he said he was,
 Though no one living ever saw his pictures.
He had a camera, I know, because
 I've seen it, and some other of his fixtures;
I know this much, I never saw him use it,
 But that, perhaps, was more my fault than his,
Though ev'ry now and then he'd try to booze it
 By borrowing from an "uncle" in the biz.

His strongest point was just to be a critic,
 The less he knew the harsher critic he,
He said God made him that way—analytic
 As to X rays, soap, photography and tea.
About the soap I'm not so very certain,
 It isn't always safe to judge by smell,
So charity suggests I draw the curtain,
 And just go on with what I have to tell.

He was a critic. That's the central fact,
 Photography was quite his strongest point,
I've heard it said he had more cheek than tact,
 And in his tongue a patent swivel joint;
He'd nose, and poke, and sniff around a frame,
 And wait to hear opinions there expressed,
And then at once the inspiration came,
 And people fled with cries of "Give us rest!"

He'd talk anastigmats, and common lenses,
 Line and color screens, and patent process blocks,
A heap of stolen fads, and freaks, and frenzies,
 Till they began to look for bricks and rocks;
And then he'd tout to try and sell some paper
 On commission, and with alcoholic breath,
They didn't kill him, though they often swore to,
 But he's dead. The verdict "accidental death."

—X Ray, in Australian *Photographic Review*.

A Very Powerful Intensifier.—The other day I "hit" upon a very powerful intensifier quite accidentally. I was intensifying a negative by bleaching in bichloride of mercury ½ oz., sal ammoniac ½ oz., water 12 ozs., and re-developing with pyro-soda (Ilford formula).

I had been previously developing some bromide prints with ferrous-oxalate, and accidentally put the plate in an unwashed dish containing a drops of ferrous-oxalate developer. Unconscious of my mistake, I poured on the pyro-soda, when to my surprise the solution turned a bright purple, the plate darkened very rapidly, and when I took it out, the high lights were so dense that the eye could not see the flame of a lamp through them, while the whole negative was of a reddish purple tent.

Although the negative was a perfect "ghost" when I started intensifying, it yielded a print much too "hard" for my liking.

R. A. H. in *The Photographic News*.

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NOTES.

The Queen of England signs her name to over a thousand photographs every year for presentation to her friends.

Many years ago, an eminent firm of dry-plate manufactures issued a batch of plates in boxes, the lids of which bore the legend: "Notice—This box not to be opened until the instructions inside have been read."

If you do not Use a Carbutt X-Ray Plate use a slow one for making Roentgen photographs. The slow plate is just as sensitive to the rays and there is less danger of fogging during development.

The F. Gutekunst Co. have, we regret to say, recently suffered a severe loss by fire. Almost the whole of their photo-engraving department was destroyed by fire. The damage is estimated at $25,000.

Facsimiles.—"I think Nell's new photographs must look exactly like her." "Why?" "She hasn't shown them to a living soul."

With the death of "The Photographic Review" (British), the *Australasian Photographic Review* begins a new life. It is now an entirely new and thoroughly Australian magazine.

Marriage Bells.—We are pleased to announce the marriage of Dr. Wm. Henry Robey, Jr., son of Mr. W. H. Robey of the well-known firm of Hogan, Robey & Co. of Boston. We extend our congratulations to the happy couple.

Non-Inflammable Celluloid.—By dissolving ordinary celluloid in acetone, and mixing it with a solution of magnesium chloride in alcohol, a non-inflammable celluloid has been discovered by a French lady, Madame Asselot.

The Souvenir Number of the Photographic Recorder published by Messrs. Zimmerman Bros. of St. Paul, Minn., reflects the highest credit on the producers. The examples of portrait work contained therein should be of considerable value to the professional.

An International Exhibition of photographs will be held at Roanne (France) in May next. Mr. Walter D. Welford, 19 Southampton Buildings, Chancery Lane, London, W. C., England, has been appointed English and American agent. Full particulars can be obtained by addressing him.

Bromide Paper.—By Dr. E. A. Just. Translated by Walter E. Woodbury. London. P. Lund & Co. Price, 1 shilliug 6 pence. Fourth edition. This is undoubtedly the most complete treatise upon printing with bromide paper, including instructions for enlarging by projection.

The Photographic Times Prize Slides were exhibited on the 4th of March last, at the rooms of the Sacramento Camera Club, before a large and delighted audience. They go from there to the California Camera Club. Secretaries desiring the use of these slides should apply to the editor of this magazine.

Shakespeare and the X-rays.—Someone has discovered that Shakespeare knew all about the X-rays, for Hamlet casually remarks to his queen mother:

"Come, come and sit you down. You shall not budge.
You go not till I set you up a glass,
Where you may see the inmost part of you.

The Royal Photographic Society will organize a collection of objects illustrating the history of Photography for the Victorian Exhibition, which will be opened in London in May next. The Secretary will be pleased to hear from anyone willing to lend any article of historical interest. The address of the Society is 12 Hanover Square, London, England.

The Fourth Paris Photographic Salon will be held in that city under the auspices of the *Photo Club de Paris*, from the 14th to the 28th April next. Full particulars and entry forms can be obtained by addressing the Secretary Photo Club de Paris, 40 Rue des Mathurins, Paris. We would like to see Americans well represented at this salon.

The Photographers' Association of Canada will hold its fourteenth annual convention at London, Ontario, on August 17th, 18th, 19th and 20th.

The executive committee of the association for 1897 is as follows: President, J. H. Hopkins, St. Thomas; first vice-president, T. Baikie, Chatham; second vice-president, A. S. Green, Berlin; treasurer, J. G. Ramsey Toronto; secretary, F. G. Westlake, London; assistant secretary, E. J. Burke, London.

State Aid Towards Roentgen Work.—It is stated that a sum of 50,000 marks is appropriated to the Ministry of Public instruction of Prussia to assist certain public institutions and private individuals in obtaining the necessary apparatus for investigations with Roentgen rays. Part of the sum is allotted for the purchase of instruments, the other part towards the cost of working. According to the same source, such a set of apparatus costs, in Germany, a sum equal to about $625.

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"Through the Various Experiments of Dr. Neuhass," says the *Photogram*, "it has been demonstrated that a gelatine plate soaked in a pyro-gallic acid developer appears luminous if placed in a solution of citric acid, becoming, at the same time, useless for photographic purposes. If two per cent. of citric acid is added to a fresh solution of pyro-gallic acid the mixture becomes luminous. This property is due to the presence of the three bodies—pyrogallic acid, sulphate and carbonate of soda—and is apparently due to an interchange of oxygen between them."

Prof. E. E. Barnard, who will now take charge of the Yerkes telescope at Williams Bay, Wis., has just returned from England. He was called to that country to receive the gold medal of the Royal Astronomical Society. This was awarded him for

1st. The discovery of the fifth satellite of Jupiter.
2d. Astronomical Photography.
3d. General astronomical work.

Prof. Barnard has kindly consented to contribute another article to this magazine at an early date.

The Camera Club of the Montclair High School, Montclair, N. J., held a Lantern Slide competition in the Lecture Room of the High School, Friday afternoon, March 26th. Eighty-one slides were shown of very good average merit. Miss Ferris won the first prize, a Presto Camera with an excellent figure picture entitled "In Old Colonial Days," and Mr. Robert Woodward won second prize, (a subscription to THE PHOTOGRAPHIC TIMES for one year), with an unusually fine architectural study of the White House at Washington. Robert Francis and Stanley Sovero received honorable mention.

The Camera Club of New York is going ahead since the recent amalgamation. At its recent meeting Prof. Elmerdorf gave an interesting account of a trip to the Windward Islands, illustrated by color lantern slides. The club has also held a "smoker," the first of the season. It was well attended and every one thoroughly enjoyed himself. If you are not a member and reside in New York you should place yourself in communication with the secretary at once at 113 West 38th Street.

Testing Sodium Sulphite.—According to Chicandard, the most likely impurities in sodium sulphite are sulphates and carbonates. To test for the former, add a few drops of solution of barium chloride, and, if the resulting precipitate is not completely soluble in hydrochloric acid, sulphate is present. Phenol phthalein gives a red color with the sulphite if carbonate is present.—*British Journal of Photography.*

Kinematograph Troubles.—The good people of Naples were treated the other day to an amusing experience of the vagaries of the kinematograph. Two or three series of moving pictures were successfully reeled off, and then the machinery stuck. The operator frantically worked to get matters right, but though he perspired in every pore, the screen showed simply impenetrable darkness. At first the music kept the spectators a little quiet, but as time passed and the darkness continued, signs of impatience commenced to make themselves evident. At this juncture a brilliant idea struck the demonstrator: "Ladies and gentlemen," said he, "you have before you a scene representing a deadly conflict between two savage tribes of negroes in a dark railway tunnel."

Rather Awkward.—There is one man, so the story goes, who curses long and loudly the cinematograph. In his amiable, husbandly way he took his wife to see the "cin," (new abbreviation), and in the Sunday afternoon disembarkation scene his better half saw what she believed to be her husband coming ashore with another lady. To be the more convinced, she saw the tableau fully half-a-dozen times with the aid of opera glasses. The accused male indignantly denies everything, but as he cannot prove a complete alibi for that particular Sunday afternoon, and his wife won't entertain the idea of an "extraordinary likeness," there is a big storm in the once happy home.

The Ferrotyper's Guide. 17th Edition, published by The Scovill & Adams Company of New York.

This little manual of instruction in the art of ferrotyping has had a phenomenal circulation, as the number of editions which have been required indicates. The seventeenth edition is an improvement over any of the predecessors, being printed on better paper, better bound, and altogether turned out in a more convenient and substantial form. The price remains the same, 75 cents in paper covers, and will be mailed, postpaid, to any address, by the publishers, on receipt of that amount. It may also be had of any dealer in photographic goods.

The Amateur's Sensitometer.—Behren's revives the old idea of using the stars as a sensitometer to compare the sensitiveness of plates. He suggests setting up the camera and focusing the stars, and exposing the plates for four minutes, then capping the lens for a minute, and giving another four minutes' exposure with another stop, which should have the intensity of half the first, and so on, till four or five stops have been used. The two plates to be compared should be exposed one after the other, and interrupted star trails will be obtained of various strengths and numbers, and by superimposing the plates it will be easy to determine with which exposure the two plates are equal. Thus, assuming that No. 1 plate showed a star trail with $f/25$, whilst with No. 2 plate it only showed with $f/12.5$, then No. 1 plate would be four times as sensitive as No. 2.—*British Journal of Photography.*

The Detroit Camera Club.—At the last meeting of this society a special committee was appointed to devise a plan for a spring exhibition. The decisions of the committee were received with approval, and accepted in the main. In accordance therewith an exhibition will be held during the first week in May. Six classes were determined upon: Marine, landscape, interiors, portraits, animal and figure studies. There will be two sections. In the first the entire work must be accomplished by amateurs, and in the second, only the negative need be made and developed, the printing and

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mounting being allowed by professionals. Gold and silver medals will be given as prizes in each class.

During the evening, a letter was read from Director Griffith, of the Art Museum, which offered the use of the museum for exhibition purposes. The members of the club accepted the letter with thanks.

The Philadelphia Photographic Society.—One of the most successful public demonstrations of the X-rays, and of the method of employing them, which has been seen in this city, was given recently at the Photographic Society of Philadelphia, by Mr. John Carbutt, who read a paper upon "Photographing the Unseen." He gave a general résumé of the progress of photographic science in general and of the Röntgen rays in particular, and exhibited the phenomena by means of a very complete apparatus. During the meeting a radiograph of the hand of the President, Mr. Burroughs, was made, and the plate developed. It was completely successful.

Mr. John Bartlett read and interesting paper on "Motion in Photography," which he illustrated with examples from painting and sculpture. Some new apparatus was shown, and nominations for officers and Directors were made.—*Phil. Ledger.*

Photography in Russia.—M. Naudot describes his visit to Moscow during the recent coronation of the Czar, in the *Bulletin du Photo Club de Paris.* It is a difficult matter, he explains, to obtain permission to use a camera at any time in Russia, and on the occasion of the coronation the most severe measures were taken to prevent photography. Although he made many applications for a special permission to the officials at Moscow and St. Petersburg before leaving Paris, the privilege was denied, and in default of proper authority, he made a few snap-shots at considerable peril, risking the fine of several hundred roubles and even imprisonment. But France itself, the country of liberty, is not many degrees better than Russia; the photographer who wishes to do any work in the public gardens or squares, or indeed anywhere beyond the streets must have a permission, and he is by no means unlikely to be ordered off by the officious *sergeant de ville* even in the principle thoroughfares. If by any chance he should approach a fortification he will find himself the central figure in a most unpleasant vortex of excitement, representing a phase of the French people, which, in a nation of such enlightenment, is nothing short of disgraceful.—*The Practical Photographer.*

Improving Under-Exposed Negatives.—The *Bulletino* of the Photographic Society of Italy, remarking on under-exposed plates, gives a simple method of remedying that evil. Negatives which have been under-exposed, but are not wanting in detail, so far as can be seen, may be made to yield fairly satisfactory prints by placing them for a short time in a weak solution of a blue green aniline dye. This dye becomes absorbed by the gelatine in inverse proportion to the quantity of reduced silver forming the image. By this the denser parts of the negative absorb little, if any, color, and, at the same time, the transparent portions take up a considerable quantity. This result produces a kind of compensation, by means of which excessive contrasts are greatly modified, if not entirely done away with.

Photographer's Copyright League.—At a regular meeting of the Photographers' Copyright League on Thursday, January 14, 1897, the following note was offered and unanimously received, and a request made that the same be entered upon the minutes of the League and a copy of the same be sent to the family of our late loved and honored President Napoleon Sarony.

In looking back upon the remarkable development of the photographic art during the last three decades we feel that to no one person are we so indebted as to Napoleon Sarony. Not only is this true as to his genius and knowledge, but for the courage of his convictions and his bold determination that the commonplace should surrender to the artistic. His bold leadership in this direction gave heart to these, who also felt that the art-science could be brought to a higher plane and who fell into the ranks to fight for excellence.

Antagonized by the ignorant, he was followed by those who were ambitious to better themselves and their art. This influence extended throughout the country and is felt to-day by many who do not realize or know to whom they are indebted. Therefore be it

Resolved, That realizing as we do that his life was well rounded out in years, reputation, and leadership, we join in sincere grief that inexorable time has claimed its own, and we herewith extend to his family our sincerest sympathy in their great sorrow. Family, friends, and art are alike bereaved.

Photography in Colors.—Yet another process comes from France. At a recent meeting of the Société Française, M. de Saint Florent read a paper on a new process he had discovered. Celloidin (collodio-chloride) paper was used, exposed to sunlight until it had assumed a reddish-black color. After this the paper was immersed for ten minutes in the following bath:

Alcohol (36 deg. Beaume)	3 ounces
Glycerine	2 drachms
Tincture of iodine (24 per cent.)	2 drachms
Ammonia (.880)	6 drops

After drying in the dark room, the paper was exposed under a colored transparency to direct sunlight, for an hour or so, until the colors appeared. It was then fixed in a six to ten per cent. solution of hyposulphite of soda. Whilst in this bath the colors came out very brilliantly and then faded to a lemon yellow color, when the print was withdrawn from the bath and washed rapidly, after which it was dried in the sun or in front of a bright fire. This caused the colors to reappear in all their brilliancy, and to remain permanent. The process sounds rather too good to be true, but it is easy to verify the accuracy of the author's statements. As will be readily seen, the process is essentially different from that of M. Graby. If M. Saint Florent's method does work and give permanent results, the latter are probable of the nature of interference colors, similar to those obtained by M. Lippmann.—*Photogram.*

Enlarged Negatives.—The whole success of the method of making an enlarged negative according to G. Haumer Croughton, depends upon the transparency, and the reason he assigns for so few photographers succeeding is because they do not realize that the transparency must be what most would call over-exposed and over-developed. A transparency which would be all

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right to hang in a window with a ground-glass backing would not yield a good negative. It must be covered all over, except the very highest lights, and must have unbroken gradations from top to bottom of the scale of tones, no bare glass except a very limited number of the highest lights in the picture, and these must be led up to by fine gradations. In using dry plates for this work choose a slow plate, and preferably a plate that can be used with an oxalate developer. You will get a much cleaner transparency, and the color will be much better for reproducing the negative from. If the transparency should need strengthening it can be done with bichloride of mercury followed by ammonia. But be *sure* to *varnish* your negative. In my experience I found that it was best not to make the transparency too sharp. Do not use too small a stop in the lens, and if the grain is too coarse turn the lens out a little *away* from the ground glass. This is important, as if you turn the lens in *towards* the ground glass the effect is very different. This will soften and make indefinite the coarseness of grain which is seen in all enlargements, and enable the retoucher to do his work better, and loss of sharpness can easily be remedied by the pencil, working around the eyes, developing the pupil, defining the line round the outline of the ball, the line of the lash, eyelid, etc.

An Important Point in Fixation.—Mr. C. Welbourne Piper brings a matter of interest under notice with reference to loss of density in fixation, in an article in the *British Journal* for the 29th ultimo. "In cases of normal exposure," he points out, "development is never carried as far as possible; consequently the film, when immersed in the fixing bath must contain a considerable proportion of partially reduced silver haloids or subsalts, which will be decomposed by the hypo into metal and soluble normal salt; that is to say, metallic silver is reduced during fixation. If this reduction takes place in the presence of a haloid salt, a soluble haloid salt of silver may be formed, and metal lost that otherwise would go towards making up the density of the image. It is fairly obvious that loss of density in the fixing bath depends a good deal upon incomplete development. An under-developed film loses a great deal even in plain hypo bath; while, on the other hand, an under-exposed film that has been subjected to forced development, loses very little. In the first case, the development of the exposed particles is very incomplete, and a great deal of subsalt must be carried into the fixing bath; in the second case, the reduction of the few particles exposed is fairly complete, and very little subsalt remains. It therefore seems highly probable that loss of density is mainly due to the presence of subsalts in the film; or, in other words, to the reduction of metal in an extremely fine state of division during fixation." This explains why "hard" negatives become harder in fixing, and negatives with any tendency to "thinness" correspondingly thinner.

Roentgen Marvels Eclipsed.—It may be rash to pronounce that anything is beyond the photographer's art. But the communication just made by the Paris Académie de Médecine by Dr. Baraduc is so astonishing that if he had made it before Dr. Roentgen had rendered his discovery public, very few people would have been inclined even to inquire into the matter. Indeed, Dr. Baraduc affirms he has succeeded in photographing thought, and he has shown numerous photographs in proof of his assertion.

His usual method of proceeding is simple enough. The person whose thought is to be photographed enters a dark room, places his hand on a photographic plate and thinks intently of the object the image of which he wishes to see produced. It is stated by those who have examined Dr. Baraduc's photographs that most of them are very cloudy, but that a few are comparatively distinct, representing the features of persons and the outlines of things. Dr. Barabuc goes further, and declares that it is possible to produce a photographic image at a great distance.

In his communication to the Académie de Médecine he relates that Dr Istrate, when he was going to Campana, declared he would appear on a photographic plate of his friend, M. Hasden, at Bucharest. On the 4th of August, 1893, M. Hasden, at Bucharest, went to bed with a photographic plate at his feet and another at his head. Dr. Istrate went to sleep at Campana, at a distance of about three hundred kilometres from Bucharest, but before closing his eyes he willed with all his might that his image should appear on the photographic plate of his friend. According to Dr. Barabuc, that marvel was accomplished. Journalists who have examined the photograph in question state that it consists of a kind of luminous spot on the photographic plate, in the midst of which can be traced the profile of a man.—*Paris Dispatch to London Standard.*

The Camera Club (of New York) is now one of the most progressive of American photographic societies. In order to encourage the members and stimulate their energies, the Presidents, Mr Dexter H Walker, and W. D. Murphy, have offered a handsome silver cup for the best photographs by members of the Society.

The following are the Rules governing the "Presidential Print Prize Competition".

1. Competition open to all Life and Active members of the Club.

2. Awards to be made by the Print Committee of the Club, and to be announced at the May meeting in 1897, and in the succeeding years at the annual meeting of the Club, at which time the President shall appoint the Committee for the ensuing year.

3. The name of the winner to be engraved upon a cup which is to remain in his custody until the first day of the following March, when it shall be returned to the Committee.

4. If won three times by the same member, the cup becomes his individual property and competition ceases.

5. Negatives and prints to be the work of the exhibitors.

6. The Print Committee is duly empowered to make any rules and regulations, not inconsistent with the above, and the decision of said Committee shall be final upon all points.

7. The winner is to give to the Club a copy of the full set of prints on which the award is made.

8. The right is reserved to have the winning prints reproduced in the Club, or other suitable journal, should it be desired.

DEXTER H. WALKER.
WM. D. MURPHY.

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RULES OF THE PRINT COMMITTEE GOVERNING THE PRESIDENTIAL PRINT PRIZE.

1. Competitors to qualify must submit not less than three nor more than seven prints.

2. In judging, 60 per cent will be allowed for artistic merit, and 40 per cent. for technique, the general average of all prints submitted by each competitor to govern the award.

3. Any print having received an award in any competition whatsoever prior, to the first day of April, 1897, will be disqualified. (Note) This rule is made to encourage new workers and new work.

4. All exhibits must be mounted and not framed. The mounting will be considered as a part of the exhibit.

5. No indication of the competitor's identity will be allowed on the prints. A *nom de plume* (initials may not be used) is to be written on the upper left hand corner of the back of the mount. The name and address of the competitor together with the *nom de plume* must be placed in a sealed envelope, on the outside of which must be written the same *nom de plume* as is used on the prints, and this must be sent or handed to the Secretary of the Club on or before the 7th of May.

6. If any retouching on negative or handwork on print has been done, it should be so stated on the back of the mount; also, if such work was done by the competitor or not.

7. All prints must be delivered at the Club Rooms, carriage paid, on or before the 7th day of May.

8. All prints entered for competition will be on exhibition at the Club Rooms, 11th and 12th days of May.

W. FRAZER,
WALTER E WOODBURY,
CHARLES I. BERG, *Chairman*.

Mr. Alfred Stieglitz, whose superb lantern slides have been the admiration of every member of the Society, is anxious to encourage others to devote themselves to the same branch of our art, and has generously offered two handsome silver cups for the best work of members of the Society.

Strauss' New Gallery.—A unique mock trial was held yesterday morning to pass upon the sanity of Mr. J. C. Strauss in erecting his new studio at 3516 Franklin Avenue. There were present at the trial leading photographers from all over the country, from New York to San Francisco, and from the Canadian border to the gulf. To give color to the farce formal subpœnas were sent out in the legal form, summoning the jurors and witnesses to attend and testify, "without profunity and in sobriety," and warning them to no-wise fail on the peril of their lives.

The visitors, about 60 in number, got in on the early morning trains. Breakfast was served at the hotel at 9.30 A.M., and an hour later three tallyhos and a dozen carriages drove up to take the party to the Strauss studio, 3516 Franklin Avenue. Prominent among the visitors were: Ben and Jake Falk, of New York City; Perrie Mac Donald, Albany, N. Y.; Chas S. Abbott, Jamestown, N. Y.; George Ayres, New York; Thos Paterson, New York; Ben. Pilgriff, New York; W Woods, Philadelphia; L. Prince, Cincinnati; Bell Smith, Cincinnati; Mr. Core, Cincinnati; F. Place, Chicago Jos. Steffens, Chicago; L. M. Stein, Milwaukie; Mr Hodges, Chicago; Mr. Edgwood, Chicago; Dave Thompson, Kansas City; Mr. Curtis, Kansas City; J. Brusch; Chicago; I. Benjamin, Cincinnati; C. Goebel, St. Charles, Mo.; H. Hendrickson, Albany, N. Y.; Chas. Hethrington, Chicago; A. Johnson, Chicago; J. S. Schneider, Columbus; Theodore A. Marceau, San Francisco, Cal.; W. J. Root, Chicago, and Mr. Hall, of Buffalo, N. Y.

The public dedication of the structure will not take place until March 4, next Thursday, but the visitors were taken through the building yesterday. Before doing so, however, they partook of a luncheon, prepared by a prominent caterer. The visitors declared that their trip through the studio was the most enjoyable part of the day's proceedings. To start with, Chief Justice Cramer, in a congratulatory address, presented Mr. Strauss with a beautiful and costly bronze statue of Diana, the gift of his St Louis photographic friends. The statue had been smuggled into the building, and when it was unveiled, Mr. Strauss' surprise and admiration was clearly depicted. In a few words he heartily thanked his friends for their expression of good will. The studio, which was erected and furnished at an approximate cost of $40,000, was pronounced by the visiting photographers one of the finest and most beautiful in the world. Some of them went into raptures over the place, declaring that it would take its place as one of the leading places for sightseers. The building throughout is fitted with hand-carved oak casements, ceilings and stairways, and inlaid floors. There is not an inch of wall paper in the place, the walls being decorated with silk and velvet tapestries, and furnished with imported furniture. On the main floor is a public reception room, promenade, Turkish room, and art gallery. The latter contains precious pictures from the leading studios of this country and Europe. Among them are "Sarony's Bust" and a number of his original sketches. A photo of the Bradley, Martin ball room, taken just before that function opened-is also on exhibition. In the middle of the gallery is a life-size piece of sculpture from the Paris salon.

After the inspection the gentlemen took the tallyhos and carriages and were driven through the city and out the boulevards to Forest Park, where a dinner was served at the Cottage, at 3 P.M. Last night, at 6.30, about seventy-five photographers and others interested in the various branches of photography sat down to a complimentary banquet at the Southern Hotel. Mr. Strauss was the host, and, besides the visitors from other points, nearly all the well-known local photographers were present. An elaborate menu was served, and after a number of informal toasts the guests were taken to the Olympic Theater.—*St. Louis Daily Globe-Democrat.*

Minutes of the Executive Committee of the P. A. of A.—The meeting was called to order by President C. M. Hayes. Ex-President Bellsmith turned over all money and a report of all the business for 1896. Those responding to roll call were C. M Hayes, President; J. Will Kellmer, First Vice-President; W. G. Thuss, Second Vice-President; George Varney, Treasurer, and A. L. Bowersox, Secretary. Treasurer Varney presented his bond, with Arthur W. Aklen and Frank B. Ullrey, of Chicago, as securities. On motion, the bond was accepted. The report of the Treasurer, showing a

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balance for 1896 of $1,171.57, was then read. Mr. Kellmer moved and Mr. Thuss seconded, that this report be received and filed. Carried. Mr. Kellmer referred to the fact that last year some manufacturers, dealers, and their representatives, entered the Convention Hall and did business on the floor without either taking space or desk room; and in order to do justice to those manufacturers and dealers who do contribute by taking space, he moved that it is the sense of the Executive Committee to see that no manufacturers or their representatives shall do business on the floor of the Convention Hall unless he or they take floor space or desk room. The motion was seconded by Mr. Bowersox. Carried. Mr. Varney moved, seconded by Mr. Thuss, that the P. A. of A. employ a stenographer and furnish the Photographic Press the report of the Convention free of charge. Carried.

Moved by Mr. Kellmer and seconded by Mr. Thuss, that the States be divided into four divisions the same as last year. Carried.

Referring to the large amount of pictures being sent for exhibition, and the large amount of work required to hang them, especially if sent loose and unframed, Mr. Kellmer made a motion, seconded by Mr. Varney, that every exhibit must be framed with or without glass. Carried.

The following prize list was adopted:

No. 1.—Grand Portrait Prize. The Grand Portrait Prize will be a life membership in the P. A. of A., handsomely engrossed and properly signed by the officers.

No. 1.—Grand Genre Prize. On motion, $75 to be laid aside for the purchase of a Grand Genre Prize.

No. 3.—Genre Class. Three pictures, thirteen inches or larger, on any matt surface paper, subject to be chosen by the photographer; the title to be appropriately inscribed on each picture. To be framed at the discretion of the exhibitor, with or without glass. One gold medal.

No. 4.—Class A.—Twelve pictures. Three or more to be sixteen inches or larger. One gold medal, first; one silver medal, second; one bronze medal, third; and one diploma, fourth.

No. 5.—Class B. Four pictures, thirteen inches or larger. One silver medal, first; one bronze medal, second; one diploma, third.

No. 6.—Class C. Three combination pictures, any size. One silver medal, first; one bronze medal, second; one diploma, third.

No. 7.—Class D. A Rating Competition. Twelve cabinets only. These must be framed in one frame. First, one silver medal, one bronze medal to all receiving twenty-one points or over.

No. 8.—Class E. Landscapes, with or without figures. Three pictures, thirteen inches or larger. First, one silver medal; second, one bronze medal; third, one diploma.

No. 9.—Class F. Interiors. Three pictures, ten inches or larger. One silver medal, first; and one bronze medal, second.

No. 10.—Class G. Commercial Photography. Six pictures. Size to be left to the discretion of the photographer. One silver medal, first; one bronze medal, second; one diploma, third.

No. 11.—Class H. Best instantaneous pictures. Three pictures, six inches or larger, of animals, or of objects in motion; one silver medal, first; one bronze medal, second.

No. 12.—Class I. For the most tastefully arranged exhibit. One diploma.

No. 13.—Class K. Foreign Exhibit. Best collection of photographs, any size, framed or unframed, to be *delivered* to the *Association free of charge*. One gold medal, first; one silver medal, second; one bronze medal, third; one diploma, fourth.

Appointment of Judges.—Three judges to be appointed for each division of the Executive Committee, and their identity to remain unknown until after the awards are made.

2.—Three judges to be appointed for the awarding of the Grand Genre, the Grand Portrait, the Foreign, and most tastefully arranged exhibit, by the Executive Committee.

MARKINGS.

Genre Class.—First, illustration; second, originality; third, photographic results.

All portrait classes, A, B, and D; first, posing; second, lighting; and third, chemical effect.

Class C.—First, originality; second, composition, third, general effect.

Class E.—First, pictorial effect; second, chemical effect.

Class F.—First, chemical effect; second, general effect.

Class G.—First, chemical effect; second, general effect.

Class H.—First, chemical effect; second, general effect.

Class K.—First, posing; second, lighting; third, chemical effect.

FEBRUARY 10TH, MORNING SESSION.

President Hayes reported that owing to last year's successful convention, the railroad accommodations would be greatly improved this year. Mr. Broadhead President of the Celeron Amusement Company, was present and informed the Committee that they would have a new theater in which to hold the business sessions, being away from the noise, thereby giving manufacturers and dealers better opportunity to do business. Mr. Broadhead also made a proposition to light the annex by electric lights, thereby giving a much improved effect to all pictures on exhibition. Moved by Mr. Kellmer, and seconded by Mr. Varney, that Mr. Broadhead's offer be accepted. Carried. Moved by Mr. Kellmer, and seconded by Mr. Varney, that employees should gain admission on employees' fees, must present an official application (which can be procured from, and be signed by the Secretary), and signed by a proprietor of a studio, a member of the P. A. of A. in good standing. Carried.

Moved by Mr. Kellmer, and seconded by Mr. Thuss, that every exhibit must be framed, and have a card on the front, giving name of exhibitor, class, city or town, country and State. Carried.

Moved by Mr. Varney, and seconded by Mr. Thuss, that the price of dealers' desks be $12.50. Carried.

On motion, it was decided to hold but one business session each day, thereby giving manufacturers and dealers more time to sell and display their goods.

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The President appointed the following committees:

Committee on Instruction, C. M. Hayes, Chairman.

Committee on Medals and Buttons, W. C. Thuss, Chairman.

Committee on Grand Prize, G. W. Varney, Chairman.

Committee on Entertainment, J. Will Kellmer, Chairman.

Committee on Printing and Stationary, A. L. Bowersox, Chairman.

Committee on Foreign Photography, J. Ed Rosch, Chairman.

The President suggested that we call the Convention "The Red Letter Convention." Moved by Mr. Bowersox and seconded by Mr. Thuss, that we extend a vote of thanks for courtesy received from Messrs. Camp, Abbott and Broadhead, and Maltby. Also, that we thank the Indiana, Pennsylvania, and Michigan Associations for their invitations to the Executive Committee to attend their meetings. Carried. It was suggested by Mr. Bowersox that we engage a competent artist (a teacher in composition preferred), who shall give us a lecture on art and art principles. After a great deal of discussion on the subject, Mr. Kellmer moved, and seconded by Mr. Thuss, that we engage the lecturers, one on chemistry and one on art, to lecture before the Photographers at our coming Convention. Carried.

After discussing the best means of making this the "Red Letter Convention," the Executive Committee adjourned to meet at the call of the President.

A. L. Bowersox, Secretary.

RULES AND REGULATIONS.

1. All competitors must be members of the Association.

2. Exhibitors cannot compete in more than one of the following classes: A, B, or D. All photographs for Association prizes must be made from negatives taken since the last Convention.

3. When one dimension of picture is given, it applies to the extreme length or breadth of pictures in all classes. This rule applies to the size of the print, and not the mount.

4. Should any exhibitor or exhibitors use his or their influence in any way directly or indirectly with the Judges during their term of office in favor of any exhibits, it shall be the duty of the Judges to strike their exhibit or exhibits from the list. All exhibits must be framed, with or without glass. The Committee suggest a one-inch oak frame.

5. Ten markings to be the highest given for any one point; consequently thirty points is the highest that can be given to any one picture.

6. All exhibits must be delivered in Jamestown, N. Y., in care of the P. A. of A., by July 10th.

7. Application for space for exhibits in the Art Department to close positively July 6th. No space will be allotted after that day. Application for space in this department must be made to W. G. Thuss, Second Vice-President, Nashville, Tenn.

8. All exhibits of pictures must be addressed to J. Will Kellmer, First Vice-President P. A. of A., Jamestown, N. Y., and all charges prepaid.

9. Exhibits for Dealers' and Manufacturers' Department to be shipped to A. L. Bowersox, Secretary P. A. of A., Jamestown, N. Y., by July 12th, charges prepaid, and must be placed in position by 10 A. M., July 12th.

10. Have your box covers screwed instead of nailed. Mark your home address on under side of cover for return of pictures. Put screw-eyes and picture wire for hanging, in box.

11. All boxes and packages will be accepted at any time previous to July 12th, so that photographers need not feel any uncertainty about the safety of their goods. No exhibits will be allowed to be removed from the hall until after the close of the Convention.

12. No manufacturer, dealer, or other representative shall do business on the Convention floor, unless he or they take floor space or desk-room.

13. All exhibits must be framed, having a card on the front giving name of exhibitor, class, city or town, county, and State.

14. All these rules and regulations will be strictly adhered to.

15. Employees to gain admission on employee's fees, must present an official application (which can be secured from the Secretary), signed by a proprietor of a studio who is a member of the P. A. of A.

MARKINGS TO BE CONSIDERED IN ALL CLASSES.

Genre Class.—First, illustrative; second, originality; third, photographic results.

All Portrait Classes.—First, posing; second, lighting; third, chemical effect.

Classes E, F, G, and H.—First, pictorial effect; second, chemical effect.

Class I.—General effect.

Class K.—First, posing; second, lighting; third, chemical effect.

PERMANENT EXHIBIT OF P. A. OF A.

The exhibits winning the Grand Prize in the Genre and A Classes are to become the property of the Association, for the purpose of forming a permanent exhibit.

(Signed)

C. M. Hayes, Chairman.
J. Will Kellmer,
W. C. Thuss,
G. W. Varney,
A. L. Bowersox,
Executive Committee.

The Eighth Annual Exhibition of Photographs by members will be held at the Boston Camera Club, Broomfield Street, Boston, April 8th, and will remain open until April 25th.

Coming Conventions.—The Photographers' Association of America will be held at Celeron, Lake Chautauqua, N. Y., July 12–17.

The Photographers' Association of Nebraska, May 4–6, at Omaha.

The Photographers' Association of Iowa, May 11–13, at Des Moines.

The Photographers' Association of Missouri, August 10–12, at Pertle Springs.

The Northwestern Photographers' Association, August (date not fixed), at St. Paul, Minn.

The Photographic Association of Canada, August 17–20, at London.

The Photographers' Association of Ohio, August 31–September 1, at Columbus.

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TRADE NOTES.

The S. P. C. Monogram on photographic chemicals is regarded as a guarantee of excellence We advise our readers to ask for the S. P. C. brand.

New Editions of the Ferrotypers's Guide (17th) and the Photographic Amusements (2d) were recently issued and their popularity appears to be not at all abated.

A New Edition—the fourth—of "Amateur Photography," by W. I. Lincoln Adams, is in press.

The "World" Blotting Paper, being absolutely chemically pure, should be used by all careful photographers. It is the best absorbant on the market whatever, containing no wood pulp, and it does not lint the prints.

Messrs. Ross & Co., of 111 New Bond Street, London, W., the well-known English opticians, send us their latest catalogue. As usual, it is full of good things. Ross lenses are known throughout the world, but the firm does not confine itself to the manufacture of these. They are also placing on the market cameras, shutters, projecting apparatus, etc.; in fact, almost everything used by the photographer.

A Convenient Negative File has been recently introduced which will be especially prized by amateurs. Accompanying cut shows the appearance of the file. It holds 50 negatives, or lantern slides, and can be obtained in three sizes: The lantern size, 4 x 5, and 5 x 7. Ask your dealer for the Star Negative File.

Reports from the dealers would indicate that the Hammer plate is the leading favorite at present. It seems to be rapidly superseding the other standard brands, as it is absolutely uniform, with all the best qualities which the best plates should have, and yet is sold at a more moderate price than some of the others.

The Carbide Manufacturing Co., of Niagara Falls, is turning out five tons of calcium carbide, daily, for the production of acetylene.

Picture Pins are the latest fad. See the advertisement of the Standard Photo Pin Co. in this issue.

Meyer Bros. Drug Co., of St. Louis, Mo., report that their photographic department is succeeding beyond their expectations.

Francis Jenkins has placed his Graphs and Scopes on the market, for making and exhibiting animated pictures. We should think that any enterprising photographer would reap a big harvest from the possession of one of these instruments. They are always popular, and have been for some time the chief attraction at our music halls.

NOTES ABOUT PHOTOGRAPHERS.

Friese Greene has patented a process of sensitizing paper during its manufacture.

Mr. Bennetto, of Torquay, England, has sold his process of producing photographs in natural colors, for $250,000, to an English syndicate.

Strauss the well-known photographer of St. Louis, sends us an invitation to visit his new studio. The invitation is gotten up in the shape of a *subpœna* and is a clever ad.

Ed. C Dana, the well known New York photographer, died recently.



Photo by H. Van der Weyde

HENRY PEACH ROBINSON

H. P. Robinson will continue his auto-biographical sketches in our next.

Messrs. Hollinger & Reckey, of 518 Fifth Avenue, are making a name for themselves. For artistic portrait work they undoubtedly lead to day. We shall have more to say about this firm in our next.

Dr. H. Holbrook Curtis, the eminent physician of New York, has taken up photography as an aid in some scientific experiments which he has undertaken.

Mr. W. I. Lincoln Adams, President of the Scovill & Adams Company of New York, was elected a member of the Chamber of Commerce of the State of New York at its last regular monthly meeting.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF MARCH, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

No. 577,891. Photographic Lens. Henry H. Turner, Rochester, N. Y., assignor to the Gundlach Optical Company, same place.

This invention contemplates the employment of a collapsible lens-mount used in connection with a camera having a collapsible body. The mount is provided with a movable lens adapted to be collapsed by the closing of the camera and a spring for expanding the lens mount when the camera is opened. Suitable means are provided for centering the lenses when the lens-mount is extended.

No. 578,147. Screen Shutter for Color Photography. Frederick J. Harrison, Orange, N. J., assignor to E. & H. T. Anthony & Co., of New York.

A color-value screen is composed of a flexible ribbon, the ends of which are opaque and the intermediate portions sectionally colored and ruled. In addition to the foregoing the inventor employs a fixed line-screen which partially obstructs the light. Both of these devices are located between the lens and the sensitive surface and the ribbon is moved by any preferred means.

No. 578,185. Vitascope. Thomas Armat, Washington, D. C.

In carrying out the invention the inventor employs a film or strip yieldingly held by a tension device, a drum engaging the film, a wheel or disk provided with projections or portions forming a series of peripheral recesses, and a rotating element provided with a projection adapted to successively enter the recesses and engage a portion of the wheel so as to intermittently rotate the drum and move the film with a gradual start and stop motion. By this means a very small and light drum may be employed and a positive intermittent motion imparted to the film so as to avoid racking and jolting of the mechanism and unnecessary wear and strain upon the film.

No. 578,337. Stereoscope. Louis Jeffery, London, England.

A stereoscope is provided with two rollers having means for driving them in the same direction, two endless bands carrying panoramas, each passing partially around one of the rollers, and means for keeping the bands distended.

No. 578,511. Self-Acting Stereopticon. Louis H. Hart, Melbourne, Victoria.

An upright casing is provided with a screen in its upper front face and a reflector is mounted in the rear of said screen. A second reflector is located in the lower part of the casing. A slide-carrying wheel is mounted to turn on a horizontal axis at the front of the casing and means for controlling the carrier are provided. The lantern is mounted in a casing extending forwardly from the first mentioned casing.

578,620. Lens. Edward W. Barker, Philadelphia, Pa.

This is a composite lens in which a central lens is combined with a series of concentric annular lenses, all of the lenses being of the same focus. One of the inner faces of each of the concentric annular lenses has the direction of the versed sine of that portion of the complete arc presented by the convex face of the lens, which constitutes the outer face of each lens.

578,639. Magazine Camera. Lodewyk Jan Rutger Holst, Amsterdam, Netherlands.

A camera is provided with a change box and a pivoted mirror, and a flexible shutter provided with a small opening for instantaneous exposures, and with a large opening for time exposures, through which latter opening the sensitized plates can be passed. A roller is provided for the shutter and a lever is connected to the mirror, said roller being detained by a pawl acted upon by said lever, whereby the flexible shutter is rolled up and the narrow opening passes in front of the plate. A wheel is actuated by the roller and provided with a pin adapted to come in contact with said lever to again stop the shutter until the pawl again engages with the roller when the mirror is lowered.

578,905. Magazine Camera. Samuel D. Williams, Newport, England.

In connection with a magazine camera having a compartment for a quantity of separable films or plates, normally out of the focal plane of the lens, the inventor employs a single handle rotatable only in one direction, a transferring device controlled by this handle and movable in one direction for moving the plate into the focal plane and thence into the compartment, and a cam for releasing the transferring device from the plate.

578,980. Aerial Photographic Apparatus. William A. Eddy, Bayonne, N. J.

In aerial photography, as carried out in the present invention, a kite is employed having a suitable kite string from which depends a hanger which is adapted to support a platform. A boom extends from the hanger to the kite string, and a camera holder is mounted on said platform. Mechanism is connected to the camera shutter to operate the same, said mechanism being controlled by a string or the like depending therefrom.

579,882. Kinetographic Camera. Auguste and Louis Limiere, Lyons, France.

A casing is provided with an aperture and adapted to receive a ribbon, a main shaft being mounted in said casing and provided with a disk. A slide is operated by the main shaft and is provided with points which are adjustable in relation thereto, the advanced and retracted positions of said points relative to the slide and the ribbon, and their engagement with the latter being controlled by arms on said main shaft.

Design Mount 26,760, for Photographic Mount, was granted to James W. McCabe, New York, N. Y., for the term of seven years.

Certificate of Trade Mark Registration 29,616, was issued to Arthur Levy, Paris, France, for Optic Glasses and Instruments. The essential feature is the monogram "L.S.," used since September 1st, 1896.

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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

JUNE, 1897.

Number 6.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN-ILLUSTRATED MONTHLY-MAGAZINE DEVOTED-TO-THE-INTERESTS-OF-ARTISTIC & SCIENTIFIC-PHOTOGRAPHY.



THE-PHOTOGRAPHIC-TIMES-PUBLISHING-ASSOCIATION-60-AND-62-EAST-11TH-ST.-NEW-YORK.

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CHUMS.

BY E LEE FERGUSON

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THE PHOTOGRAPHIC TIMES.

VOL. XXIX. JUNE, 1897. No. 6.

SUCCESS IN MAKING FLASH LIGHT PHOTOGRAPHS.

BY LEO D. WEIL.



JESSE FOUNDSTONE.

MOST essays treating on success in any line of business or profession lay too much stress upon set rules, and neglect to offer a few suggestions which will enable the reader to develop and perfect his own individuality. The secret of success, if it may be called by such hidden art, depends not upon *rules*, but upon *individuality*. No matter how bright we are, no matter how quick we can grasp and remember what is told us, it is of little use if we do not become a part of it. We should be so totally absorbed in our undertaking that self is entirely forgotten. Then and not until then shall we see the works of a genius.

How can this individuality be best developed? In the first place we should understand that the governing power which rules this universe is founded upon a principle and this principle is good and harmonious. Anything that deviates from this principle is evil or inharmonious. Therefore, in order to keep in perfect harmony all the time, we should hold constantly before our eyes the perfect model. When we once depart from harmony there is no end to failures.

This harmony is caused through the association of ideas, or through the relation that one thought bears to another. To illustrate:—For a number of years photographers have been successful in making portraits under the studio light. As a rule the results have been successful, especially regarding the distribution of light. Now, it happens that magnesium powder for making portraits by artificial light is discovered, and we wish to make as good pictures as are made under the studio light. How shall we go at this? Should we strike out blindly and flash here and there, taking our *chances* of succeeding once out of fifty? No, that would be wasteful and unprincipled. We should remember that nothing under the sun is entirely new. The combination of two or more old ideas is the cause of new ideas. Looking at the thought in that light we can readily see that there is really nothing new. This combination of ideas is what we call the association of ideas. In order to form this association, we must have harmony. In music every two notes combined will not produce harmony. Here's where the musician's individuality comes in. So it is in anything else; every two ideas combined will not form a new idea. It is necessary sometimes to introduce more than two ideas, and there is where *our* individuality comes in. Individuality is the main thing. This we *all* possess in a large degree, but we keep it hidden behind a cloud of evil and discord. The sun is shining all the time. The clouds which occasionally obscure it from our view do not signify that the sun is not shining. So it is with ourselves. If we keep despair and other evils constantly before us, we do not allow our individuality to receive the light of truth, and consequently we are in the dark, knowing not which way to turn. Success will never come in that state of mind. Awake, young genius, the world is awaiting for your cleverest production. You know as well as not, that, if you dwell in personality, you shall be blind to the truth. New inventions are caused through relations. Therefore, if we wish to succeed in flash light photography, we should study all that has been discovered in studio lighting, as these are the

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Copyright 1898. By Leo D. Weil.

A PLEASANT ANTICIPATION

Flashlight Photograph.

BY LEO D. WEIL.

results which we wish to attain, or, if possible, better results. If you see something that pleases you in studio lighting, study the source from which it comes. Note carefully how the best effects are produced, and operate the flash on the same principle. Remember, however, that all photographers have not reached the high standard of lighting. Those who nearest approach the old masterpieces in portrait painting are the best models to follow. I think that Mr. Hollinger, of Hollinger & Rocky, comes nearest to this than any photographer I know of. He is not afraid to do what he thinks. There is too much conventionality in studio lighting, and it is best we do not follow too closely in these paths. Do not imitate anyone. Combine others' ideas with your own and you will succeed in being what is called original.

Retouched photographs are in ninety-nine cases out of a hundred, failures, as to naturalness. The less the retouching, the more artistic the results. Of course this rule cannot be applied to faces that are already "retouched" when the sitter is being photographed. Such a person can never be made to look natural because as yet we cannot photograph colors. Don't despair, however. There are more people who do not like retouching than who do. So many people have been imposed upon by the so-called "artist photographers," who have plenty of money and make a large display for effect. But when it comes to art they don't know quite as much as they pretend to.

The field in non-studio photography is unlimited, and there are hundreds of branches which can be developed separately by the artist, and each branch, if faithfully attended to, is sure to lead to results far surpassing studio work in many respects. At home one feels more natural than the artificial and foreign environments of any studio could possibly produce. The associational value which we place upon our household gods, outweighs any interest which can be said in favor of studio work. In this early stage of development of non-studio photography, it might be said that bust pictures can be best produced in the studio, but it is only a question of time when we shall see home portraiture reign supreme. Other means of artificial lighting will be invented and the facilities for working will be simplified. This, of course, depends upon the work of our young geniuses. If each one does his part in his own little territory, it will not take long before we have a crop of good fruit.

Keep everlastingly before your mind's eye the perfect model or principle, always play for harmony, and when discord seems to intrude, begin all over again on the train of thought, and keep the association under careful concen-

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tration. Our valuable time should not be wasted trying to discover the cause of this discord (or nothing), but we should play right on harmoniously, and results will surely follow.

THE PICTURE RIBBONS USED IN CHRONOPHOTOGRAPHY. BY C. FRANCIS JENKINS.

In the April (1895) number of THE PHOTOGRAPHIC TIMES, under the caption "New Industries," I mentioned the construction of a chronophotographic projecting machine (the Phantoscope, exhibited in September following at the Cotton States and International Exposition, Atlanta), and called attention to the need of a substance better than celluloid from which the picture ribbons used therein could be made. Film makers at that time would furnish transparent strips of celluloid of the proper width and length only upon special order.

There are yet, however, no fundamental patents in the United States in this art, and the year 1896 has seen the list of projecting machines grow like mushrooms, until machines of this character are exhibited in the United States under no less than thirty-five different names.

While no better material has yet appeared, the manufacturers of celluloid film stock were not long in recognizing this art as a new industry to which they should cater, and extra heavy, clear film can now be purchased of the standard width and in long lengths as readily as any of the hand-camera films.

This film, as it is received from the makers, is from $\frac{3}{1000}$ to $\frac{5}{1000}$ inch thick, $1\frac{3}{8}$ inch wide,

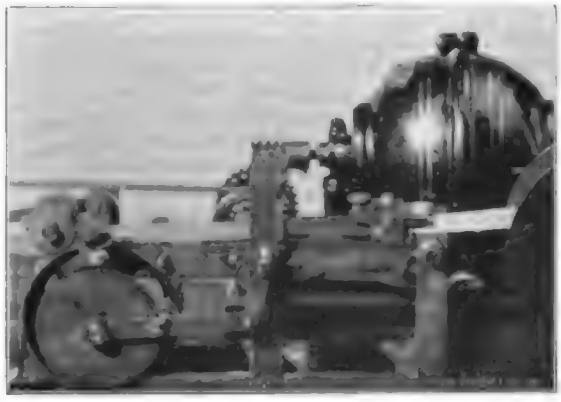


FIG. 1.—THE PERFORATOR

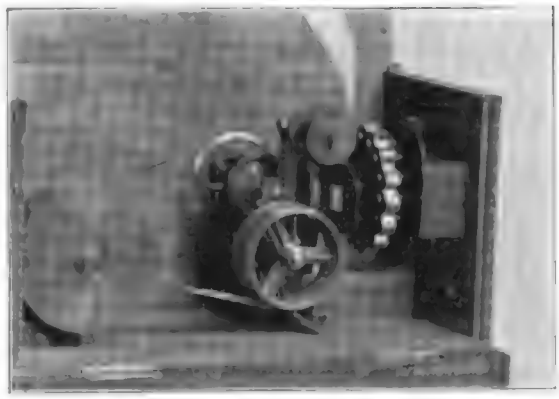


FIG. 2.—THE ROTARY CAMERA

and about 200 feet long, and, to insure its keeping qualities, is wrapped first in tinfoil, then in black paper; after which it is put into a box and sealed.

In this form the film is received by the photographer, whose first step is to perforate it with a row of small holes, $\frac{3}{16}$th-inch apart, along each edge. These small holes are punched in the film to insure perfect register in all operations the film is afterward to pass through, which, therefore, necessitates its being done with the utmost accuracy. An automatic, efficient and very accurate machine is shown in Fig. 1. It's best working rate is about 15,000 perforations per hour.

Variously constructed cameras are used, but each, usually, much resembles the projecting machine of the same system. The average rate of photographing does not exceed 1,800 exposures per minute, other statements to the contrary notwithstanding. A novel camera, and one embodying new features in its construction, is shown in Fig. 2. The lenses, of which there are 15, are arranged around the periphery of the disc-carrier, and are caused to travel across the opening in the box exactly in synchronism with the sensitive surface. It is light, small, compact and absolutely noiseless.

After the negative is exposed, developed, and dried, it is automatically and continuously fed, in contact with a like strip of film, much less sensitive than the negative film, however, beneath a light, and "positives" or transparencies printed therefrom. The printer, with the light removed, is shown in Fig. 3.

The developing is done in different ways by different operators, but the drum, rotating in semi-circular trays, probably has the most advocates. The film is spirally laid on the circum-

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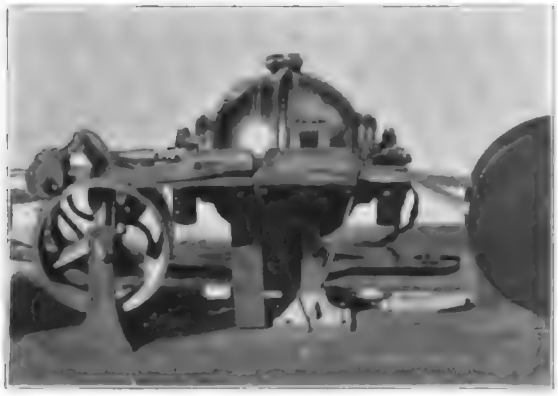


FIG. 3.—THE PRINTER

ference of the drum, and, after the developer is poured in, is rotated by means of an electric motor. The progress of development can readily be ascertained by lifting an end of the film and examining it before a conveniently located red light. The hardening and fixing is done in a similar manner, and the washing by means of a long horizontal tube pierced with dozens of little holes, from which the water is projected in tiny streams against the passing film. Two of these drums, the sprinkling tube and drying racks, are shown in Fig. 4.

As there is but one substance of which successful pneumatic tires are made, there appears to be but one substance, celluloid, from which successful picture ribbons are produced, and the investigator who first discovers a better vehicle for carrying the sensitive emulsion will reap a fortune. However, the greatest advance to be expected during the current year will be the introduction of an exhibiting machine which will better protect and more carefully handle the film, and at the same time be noiseless. The problem involved is no mean one. The thin and comparatively delicate picture ribbon must be stopped and started, say 1,800 times per minute and with the utmost exactness, and at the same time brilliant illumination of the screen maintained.

HOW INFINITELY FEW out of the myriads who photograph study the technique of photography—I don't mean focusing and developing. Mixed paints and varnishing is not painting, and having all the developers at your fingers' ends is not knowing how to render values by means of photography.—J. S. BERGHEIM.

A BRIEF ACCOUNT OF THE LICK OBSERVATORY.* BY EDWARD S. HOLDEN.

(Director of the Observatory).

JAMES LICK, who gave to the world the Lick Observatory, was born in Fredericksburg, Pennsylvania, August 25, 1796, and died in San Francisco, October 1, 1876. His body lies in the base of the pier of the great Equatorial. He learned and practiced the trade of organ and piano making in Hanover, Pennsylvania, and in Baltimore. In 1820 he was in business in Philadelphia. From there he went to Buenos Ayres, making and selling pianos. From the East coast of South America he came to the west, and finally, in 1847, he arrived in San Francisco.

Successful in business, but far more successful in his investments in land, he became rich, and died leaving an estate of some $3,000,000. This was all devoted to public uses. His deed of trust charged the Board of Lick Trustees to expend :

For a monument in San Francisco to Francis Scott Key, author of the "Star Spangled Banner," the sum of $60,000 ;

For statuary, emblematic of three significant epochs in the history of the State of California, to be placed in front of the San Francisco City Hall, $100,000 ;

For a Home for Old Ladies in San Francisco, $100,000 ;

For Free Baths in San Francisco, $150,000 ;

For a California Institute of Mechanic Arts—a manual training-school for the boys and girls of San Francisco, $540,000 ;

* Prepared by direction of the Regents of the Observatory.

NOTE. We are indebted to the kindness of Prof. Holden for the use of the illustrations to this article.

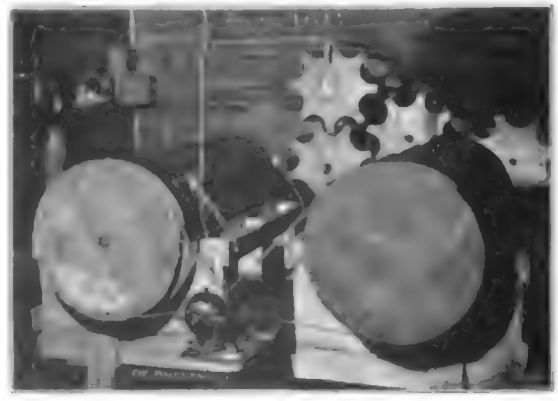


FIG. 4.—THE DEVELOPER

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For the Lick Observatory, to contain the most powerful telescope in the world, $700,000; besides many other important bequests, to the Society of California Pioneers, to the California Academy of Sciences, and other beneficiaries.

His exact provisions in regard to the Observatory were:

Mr. Lick's Second Deed of Trust.

"*Third.*—To expend the sum of seven hundred thousand dollars ($700,000) for the purpose of purchasing land, and constructing and putting up on such land as shall be designated by the party of the first part, a powerful telescope, superior to and more powerful than any telescope yet made, with all the machinery appertaining thereto and appropriately connected therewith, or that is necessary and convenient to the most powerful telescope now in use, or suited to one more powerful than any yet constructed; and also a suitable observatory connected therewith. The parties of the second part hereto, and their successors, shall, as soon as said telescope and observatory are constructed, convey the land whereupon the same may be situated, and the telescope and the observatory and all the machinery and apparatus connected therewith to the corporation known as the Regents of the University of California; and if, after the construction of said telescope and observatory there shall remain of said seven hundred thousand dollars in gold coin any surplus, the said parties of the second part shall turn over such surplus to said corporation to be invested by it in bonds of the United States, or of the city and county of San Francisco, or other good and safe interest-bearing bonds, and the income thereof shall be devoted to the maintenance of said telescope and observatory, and shall be made useful in promoting science; and the said telescope and observatory are to be known as the Lick Astronomical Department of the University of California."

Building of the Observatory.

Under the provisions of this deed, a Board of Trustees, composed of Messrs. R. S. Floyd, William Sherman, E. B. Mastick, Charles M. Plum, and George Schoenwald, built the Observatory and transferred it to the Regents of the University on June 1, 1888. The whole cost of the establishment was $610,000 (the instruments costing $111,906.38), and $90,000 is invested as an endowment.

Support of the Institution.

The interest on $90,000 is entirely insufficient for the support of the Observatory, and the



THE ROAD TO MT. HAMILTON

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THE OBSERVATORY FROM THE NORTH-EAST

deficiency is made up by annual appropriations from the University income. While these appropriations are as large as can be properly made, they are still far less than actual wants. The Lick Observatory is one of the best equipped institutions in the world, but its annual income is much less than that of any other establishment of the first class.

For the purposes of comparison, it may be stated that the number of persons employed in purely astronomical work at some of the leading observatories is: Observatory at Greenwich, about 30; Observatory of Harvard College, about 40; Observatory of Paris, about 17 astronomers and many computers; Observatory of Pulkowa (St. Petersburg), about 16; Observatory of Rjo Janeiro, about 16; Observatory of Washington, D. C., about 19. The Lick Observatory has seven observers in all. The annual incomes of some of the establishments named above are three times those of the Lick Observatory, and the expenses of all of them are at least twice as much.

It is worth while to give this comparison explicitly, because the impression prevails that the Lick Observatory is as liberally endowed as it is magnificently equipped; whereas the facts are, unfortunately, very different.

Gifts to the Lick Observatory.

The income of the Observatory is barely sufficient for its current work. For the purchase of special instruments and apparatus and for the expenses of expeditions sent to foreign countries for the purpose of observing total solar eclipses, we have had to depend on the gifts of numerous friends. Among them should be named: Miss C. B. Bruce of New York City; Hon. D. O. Mills of New York City; Hon. C. F. Crocker of San Francisco; Edison General Electric Company of New York City; Mrs. Phebe Hearst of San Francisco; W. W. Law of New York City; Dr. S. P. Langley, Smithsonian Institution, Washington; Dr. T. C. Mendenhall, U. S. Coast and Geodetic Survey, Washington; the trustees of the Thompson fund, A. A. A. S., and others.

Officers of the Observatory.

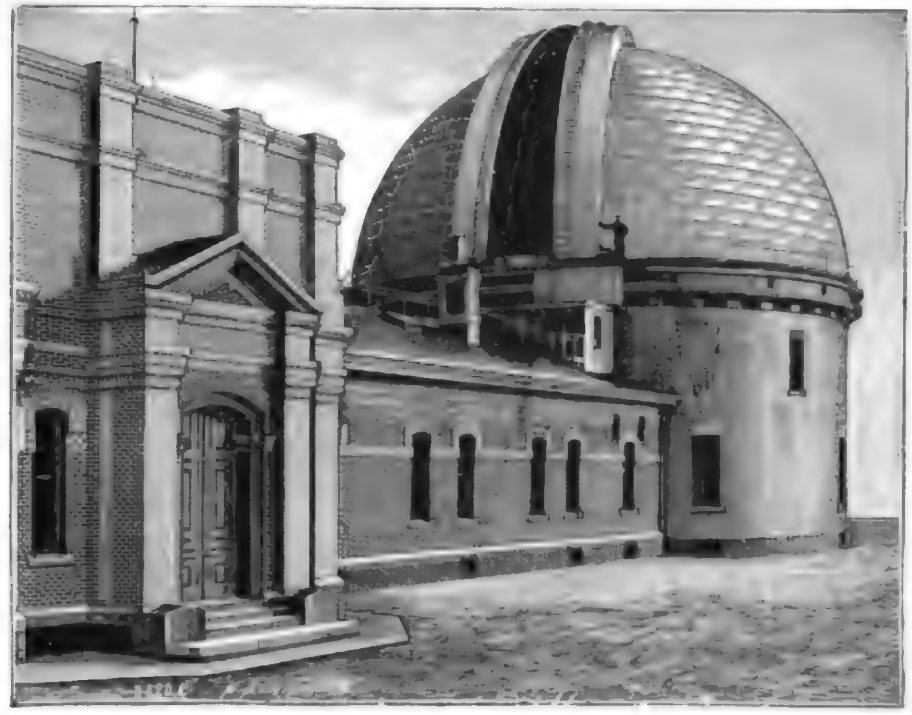
The sections immediately following are extracted from the Register of the University and give the official status of the Observatory as a part of the University:

Martin Kellogg, President of the University; Edward S. Holden, Director and Astronomer; John M. Schaeberle, Astronomer; Edward E. Barnard, Astronomer; William W. Campbell, Astronomer; Richard H. Tucker, Jr., Astronomer; Allen L. Colton, Assistant Astronomer; C. D. Perrine, Secretary.

History of the Lick Observatory.

Mr. Lick, in August, 1875, selected Mount Hamilton, in Santa Clara County, as a site for the Observatory. Land for the site (1350 acres)

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THE WEST FRONT OF THE OBSERVATORY

was granted by Act of Congress, June 7, 1876, One hundred and forty-nine acres additional were purchased by Mr. Lick, and a tract of forty acres was added by gift of R. F. Morrow, Esq., in 1886. The north half of section sixteen of the township was granted to the University, for the use of the Observatory, by the Legislature of California in 1888. This land (320 acres) is continuous with the grant from the United States. Congress also granted, in 1892, an additional tract of 680 acres, making the total area of the Reservation about 2581 acres. A road to the summit of Mount Hamilton (4209 feet above the sea) was built by Santa Clara County, at a cost of about $78,000, in the year 1876.

Buildings and Instruments.

The Observatory consist of a Main Building, containing computing rooms, library (of 3000 books and 3000 pamphlets), and the domes of the 36-inch equatorial and the 12-inch equatorial; and Detached Buildings to shelter the Meridian Circle, the Transit, the Horizontal Photo-Heliograph, the portable Equatorial, and the Crocker Photographic Telescope. On the grounds are dwelling houses for the astronomers, students, and employés, and shops for the workmen. The Observatory is fully provided with instruments, the most important of which are named below.

36-inch equatorial; objective by Alvan Clark & Sons, mounting by Warner & Swasey. This instrument has also a photographic corrector of 33 inches, figured by Alvan G. Clark.

12-inch equatorial; by Alvan Clark & Sons.

6½-inch equatorial; objective by Alvan Clark & Sons, mounting by Warner & Swasey.

6¼-inch meridian circle; objective by Alvan Clark & Sons, mounting by Repsold.

4-inch transit; objective by Alvan Clark & Sons, mounting by Fauth & Co.

4-inch comet seeker; by Alvan Clark & Sons.

5-inch horizontal photo-heliograph; by Alvan Clark & Sons.

Crocker Photographic telescope; objective by Willard, refigured by J. A. Brashear, who provided the mounting also. There are, besides, many minor pieces of astronomical, physical, meteorological, and photographic apparatus, including spectroscopes, seismometers, photometers, micrometers, clocks, chronographs, etc.

Regulations Regarding Students.

The Regents of the University have established the following regulations: "The regular

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LOOKING NORTH-EAST ON THE SUMMIT

course of undergraduate work in astronomy in the University will be given in part in the Colleges of Science at Berkeley, and the remainder at the Lick Observatory, to pursue a higher course of instruction in astronomy, provided that, after examination, they show themselves competent. Such students may become candidates for the higher degrees of the University, in the ordinary manner, or they may be received as special students merely. Quarters at Mount Hamilton may be assigned to them during that portion of the year occupied in their work with the instruments, and in return for such quarters they will be required to execute such computations as are assigned to them."

"So many graduates as can be furnished accommodations at Mount Hamilton without expense to the University, may pursue astronomical studies with the Director at the Lick Observatory. Such graduate students must be either candidates for the higher degrees of the University, in the ordinary manner, or special students admitted with the consent of the President of the University, and the Director of the Observatory. Such candidates shall spend at least one year in their studies at Berkeley."

At present, all undergraduate instruction in astronomy is given at Berkeley, and the courses there are so arranged as to lead directly to graduate work at Mount Hamilton. Application for admission to graduate courses at the Observatory may be made at any time to the Recorder of the University at Berkeley; and students will be admitted on the recommendation of the Director, approved by the President of the University. Admission is ordinarily granted to graduates of the University of California, and also to graduates of other colleges and scientific schools of good standing who present satisfactory evidence of character and qualifications. Other persons of suitable age and attainments may also be admitted.

Students at the Lick Observatory may either be: (*a*) Candidates for one of the higher degrees of the University, or (*b*) special students. The higher degrees offered are Master of Arts, Master of Science, and Doctor of Philosophy. The conditions upon which they are granted are given in the REGISTER of the University, *except* that a residence at Mount Hamilton is required of all candidates for a Master's degree of *at least* four months, and of all candidates for a Doctor's degree of *at least* eight months. It is expected that students will choose their periods of residence at the Lick Observatory in the months June to November. In certain cases the requirement of Latin of candidates for the Doctor's degree *may* be remitted by the

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THE LONG HALL

proper authority. In all cases, a good reading knowledge of French and German will be required of such candidates. Particular attention is called to the fact that the higher degrees of the University are not given for mere faithfulness in the performance of allotted tasks, but that "power to do original work" (as exhibited in a thesis to be submitted before final examination, and in other ways) must be shown.

Special students are received (usually during the favorable observing weather, June to November), and every facility consistent with the scientific work of the establishment will be given to them. They will be required to follow out some line of work, to the satisfaction of the Director, and they will usually be assigned as assistants to some of the astronomers.

Hearst Fellowships in Astronomy.

Mrs. Phebe Hearst has provided a fund to be used in aid of scientific work at the Lick Observatory. A portion of this fund may be set aside for the purpose of defraying a part of the expenses of such advanced students as may be appointed, to be Hearst Fellows in Astronomy, by the Board of Regents, on the recommendation of the President of the University and of the Director of the Observatory. Such recommendations will not be made except of students who have already made decided progress in their work; and candidates for the higher degrees of the University will be preferred, in general.

Quarters for Students.

Comfortable quarters (unfurnished) are allotted to all students at the Observatory. A kitchen and dining-room (partly furnished) are also provided for the common use of students, who must make their own arrangements for board and service. The cost per month to each student need not exceed $30. No charges or fees of any sort for instruction are required from students in the University. All injuries to instruments or apparatus must be made good at the student's expense, and students are expected to provide the larger part of the chemicals used in their practise of photography. Each student should bring with him the furniture of his bed, etc., and should also provide himself with text-books.

Intending students will do well to communicate with the Director of the Observatory before making their formal applications for admission to the Recorder. The post-office address is Mount Hamilton, Santa Clara County California.

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Hours for Visitors.

The Board of Regents of the University of California has established the following regulations:

Visitors will be received at the Lick Observatory during office hours, whenever any of the astronomers are present.

Regular nights in each month, not exceeding one per week, shall be set apart for the reception of visitors, except during inclement weather, and visitors will be received on these nights between certain hours and at no other times.

The Observatory buildings will be open to visitors, during office hours, every day in the year. Upon their arrival, visitors will please go at once to the visitor's room and register their names.

An hour or so can be profitably occupied in viewing the different instruments, and the rest of the stay can be well spent in walks to the various reservoirs, from which magnificent views of the surrounding country can be had.

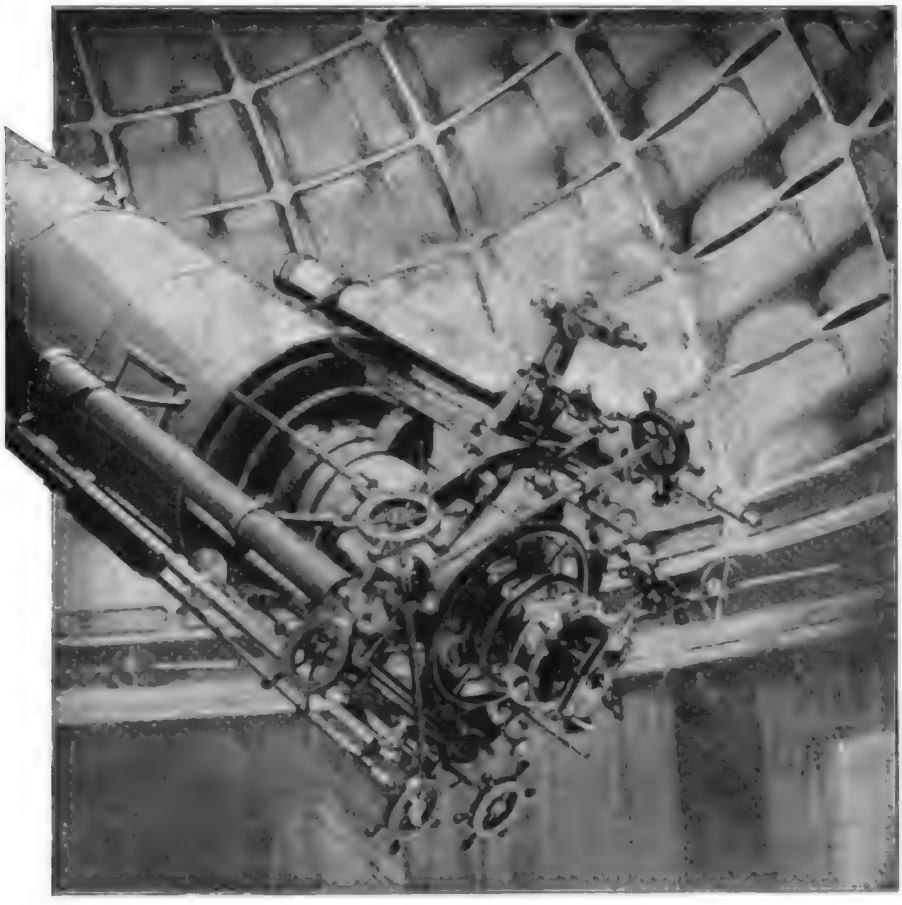


THE GREAT EQUATORIAL.

At least an hour and a half of daylight should be allowed for the drive from the Summit to Smith Creek. There are no hotel accommodaitons at the Summit.

For the present, visitors will be received at the Observatory to look through the great telescope every Saturday night, between the hours of 7 and 10, and at these times only.

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EYE-END OF THE GREAT TELESCOPE

Those visitors who come in the day time are personally conducted through the various buildings at 1.30 P.M., and the uses of the instruments are explained to them. On Saturday nights the number of visitors ranges from 30 to 300. Each person is shown the most interesting celestial objects through the 36-inch and the 12-inch equatorials. The whole force of the Observatory is on duty at such times and no pains are spared to make these visits profitable and interesting. The senior classes in astronomy in the University of California and in various other Californian colleges come to the Observatory on evenings specially set apart for them. Lectures are given by the astronomers at different places and times. All specially interesting observations and discoveries are described in the magazines or the daily press. The astronomical Society of the Pacific, which numbers more than five hundred members, holds its summer meetings at Mount Hamilton.

In these and other ways the Observatory is made directly useful to the public of California, and it cannot fail to have an important part in the intellectual advancement of the whole country.

Whenever the work of the Observatory will allow, other telescopes will also be put at the disposition of visitors on Saturdays between the same hours (only).

At 10 P. M. the Observatory will be closed to visitors, who should provide their own conveyance to Smith Creek, as there is no way of lodging them on the mountain.

It is expected by setting apart these times for visitors (which allow freer access to the Lick Observatory than is allowed to any other Observatory in the world) that all interested may be able to arrange their visits in conformity to them; and that the remaining hours of the week will be kept entirely uninterrupted in order that the astronomers may do the work upon which the reputation and the good name of the Observatory entirely depends.

NUMBER OF VISITORS.

Visitors admitted for the year ending June 1, 1889	6,400
Visitors admitted for the year ending June 1, 1890	5,132
Visitors admitted for the year ending June 1, 1891	5,005
Visitors admitted for the year ending June 1, 1892	5,959
Visitors admitted for the year ending June 1, 1893	5,472
Visitors admitted for the year ending June 1, 1894	5,747
Visitors admitted since June 1, 1888	33,715

INSTRUMENTS OF THE OBSERVATORY.

The instrumental equipment of the Observatory is of the highest excellence, and it is practically complete with one exception. From the beginning it was contemplated to supplement the great refracting telescope by a large reflector. This part of the original plan has not yet been carried out, but our experience has demonstrated the need of such an instrument, and it is very important that this addition should be made. When it is made, two great

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THE TWELVE-INCH EQUATORIAL.

telescopes—a refractor and a reflector—will still give to the Observatory the most powerful instrumental equipment in the world.

From 1888 to 1893 the 36-inch refractor of the Lick Observatory was the largest in the world. In the present year a 40-inch telescope has been completed for the University of Chicago.

Scientific Work of the Astronomers.

It is quite impossible in the present place, to speak of the scientific work of the Observatory in any detailed way.

Ten new comets, a great number of double stars, and a new satellite to Jupiter have been discovered here. The photographs of solar eclipses and the results drawn from them by our astronomers have put a new face on the question of the constitution of the solar corona. The detailed study of the sun's surface, by photography, has lately been taken up.

Photographic and visual observations of Comets, the Milky Way, the Moon and Planets have added very greatly to our knowledge. Our spectroscopic observations of Nebulae, Stars, and Comets are of hitherto unattained accuracy and have led to quite new views. For the first time the angular diameter of a fixed star has been measured here. For details regarding these discoveries and observations, reference must be made to the publications of the astronomers in the scientific journals, and especially to the "Notices of the Lick Observatory" printed by the Astronomical Society of the Pacific.

Owing to the comparatively small income the Observatory it has been impossible to undertake researches in all branches of astronomy. The attempt has been to select a certain number of fields and to attain excellence in each field selected.

Whenever an increased endowment, by gift or otherwise, becomes available, new fields can be occupied with every prospect of success. The site of the Observatory is very favorable in all respects. Its instrumental equipment is unrivalled.

Coöperating Foreign Astronomers.

The Lick Observatory is in close coöperation with all other astronomical observatories and with astronomers abroad and at home. Several foreign astronomers are giving a large part of their working time to measures and discussions of astronomical photographs made here. Among these gentlemen especial mention should be made of Professor Weinek, Director of the Observatory of Prague, who is engaged in making enlarged drawings and photographs from the negatives of the moon taken here; Baron Albert von Rothschild of Vienna is working in the same direction; Professor Franz of the University of Kœnigsberg; Dr. Victor Nielsen of Copenhagen; Dr. Boeddicker, astronomer in Lord Rosse's Observatory; A. Stanley Williams, F.R.A.S., of London, and others. All of these astronomers are assisting the Observatory in different researches by systematic work of the same kind which they would do if we were so fortunate as to number them among our immediate colleagues.

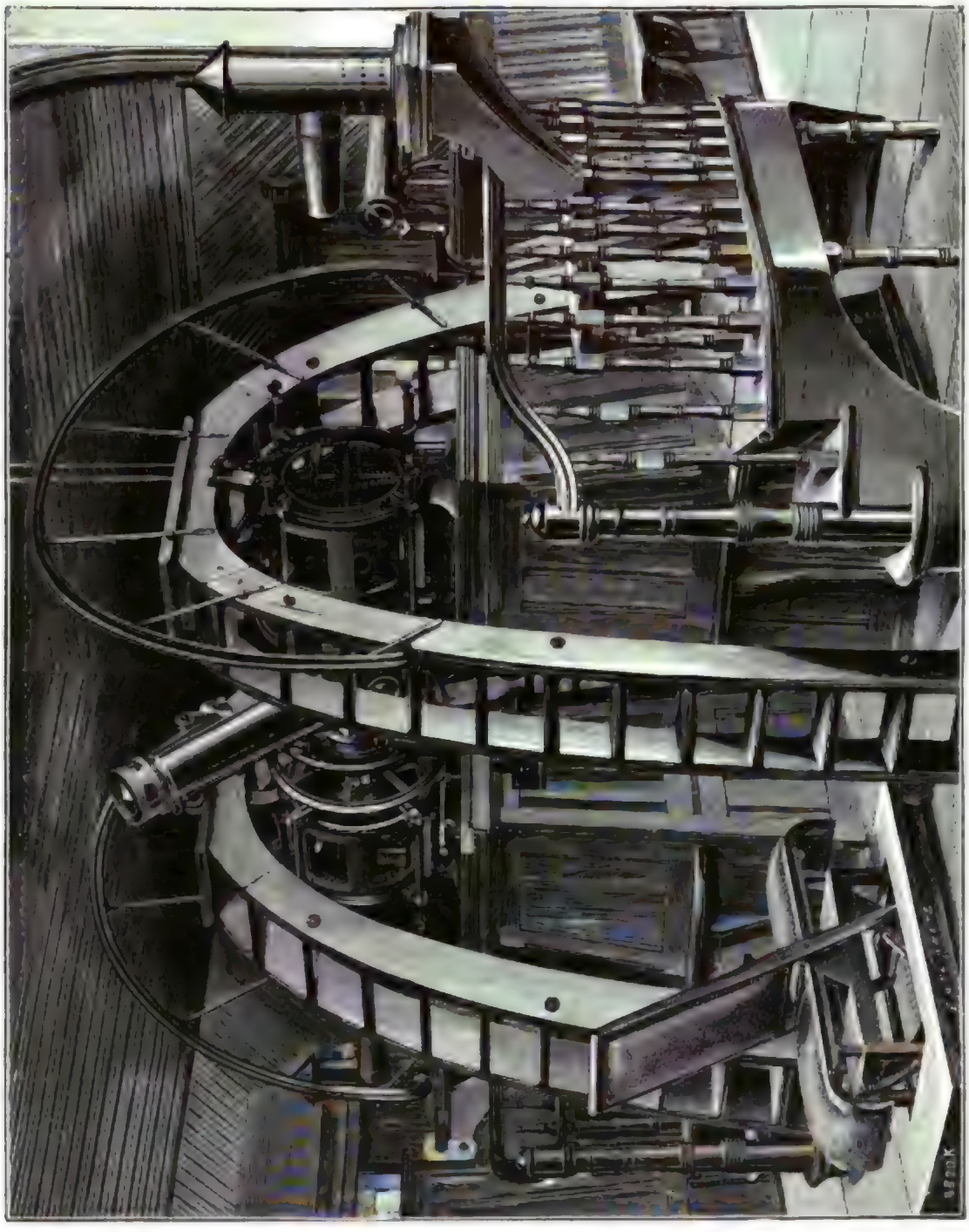
Time Service.

Accurate time signals are sent from the Observatory every day at noon, and are received at every railway station between San Francisco and Ogden; San Francisco and El Paso; San Francisco and Portland, Oregon. In this way the Observatory furnishes exact time (Pacific Standard Time), without cost, to the inhabitants of many States and Territories.

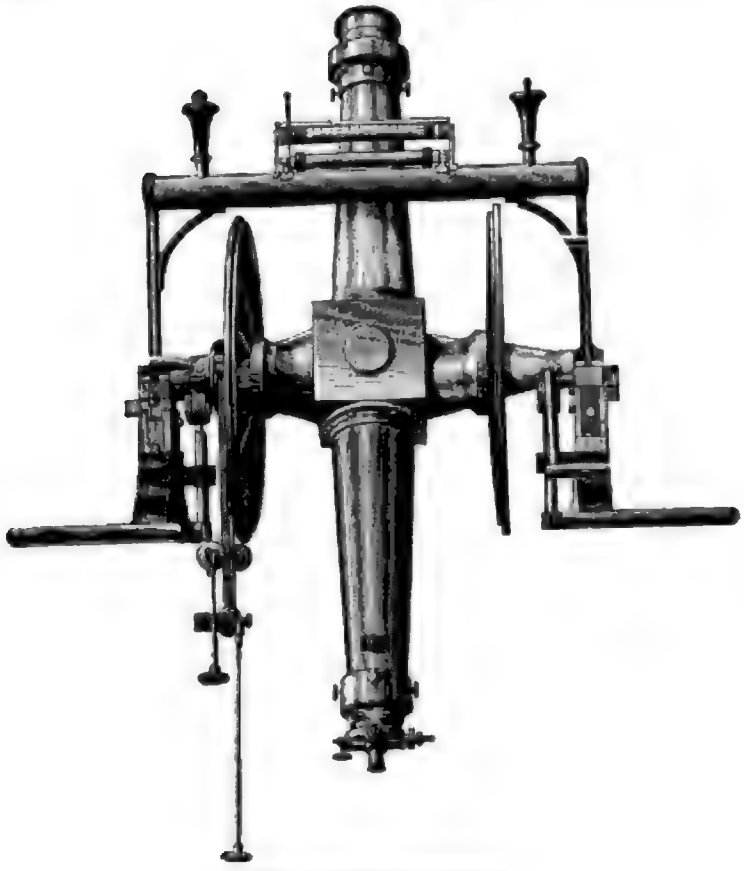
Earthquake Observations.

A complete set of earthquake instruments registers the time and intensity of all shocks felt here, and a catalogue of such statistics is yearly printed. These are the first systematic

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THE MERIDIAN CIRCLE



THE TRANSIT INSTRUMENT

observations of the kind made in California. Meteorological records are also kept.

Works Issued by the Lick Observatory.

Two series of works, the first, in quarto, known as "Publications of the Lick Observatory;" the second, in octavo, known as "Contributions from the Lick Observatory," are printed from time to time by the direction of the Regents of the University. They are technical in character. They are not for sale, but are exchanged with other scientific institutions in return for gifts to the library of the Observatory. The works already published are:

1. Publications of the Lick Observatory of the University of California, prepared under the direction of the Lick Trustees, by Edward S. Holden, Volume I, 1887. Sacramento, 1887, 4to. [Containing a brief history of the Observatory, with descriptions of the buildings and instruments; observations of double stars by S. W. Burnham, 1879; of the transit of Mercury, 1881; by Messrs. Floyd, Holden, and Burnham; of the transit of Venus, 1882, by D. P. Todd; meteorological observations, by T. Fraser, 1880-85; and reduction tables for Mount Hamilton, by G. C. Comstock.]

2. Suggestions for observing the total eclipse of the sun on January 1, 1889, published by the Lick Observatory. Printed by authority of the Regents of the University of California. Sacramento, 1889, 8vo. [Out of print.]

4. Contributions from the Lick Observatory, No. 2. Reports on the observations of the total eclipse of the sun, December 21-22, 1889, and of the total eclipse of the moon, July 22, 1888, to which is added a catalogue of the library, published by the Lick Observatory. Printed by authority of the Regents of University of California. Sacramento, 1891, 8vo. [Out of print.]

5. Contributions from the Lick Observatory, No. 3. Terrestrial atmospheric absorption of the photographic rays of light, by J. M. Schaeberle, astronomer in the Lick Observatory. Printed by authority of the Regents of the University of California. Sacramento, 1893, 8vo.

6. Publications of the Lick Observatory of the University of California. Printed by authority of the Regents of the University. Volume II., 1893. Sacramento, 1893, 4to. [Containing double star observations made with the 36-inch and 12-inch refractors of the Lick Observatory from August, 1888, to June, 1892, by S. W. Burnham.]

Other volumes are now in preparation.

The publications of the Astronomical Society of the Pacific contain notices from the Lick Observatory, which are brief accounts of the scientific work of the institution, prepared by the astronomers. Especial pains are taken to put these accounts into a simple and popular form. The history of the Observatory can be followed from month to month in these publications.

Exhibits at the Midwinter Fair.

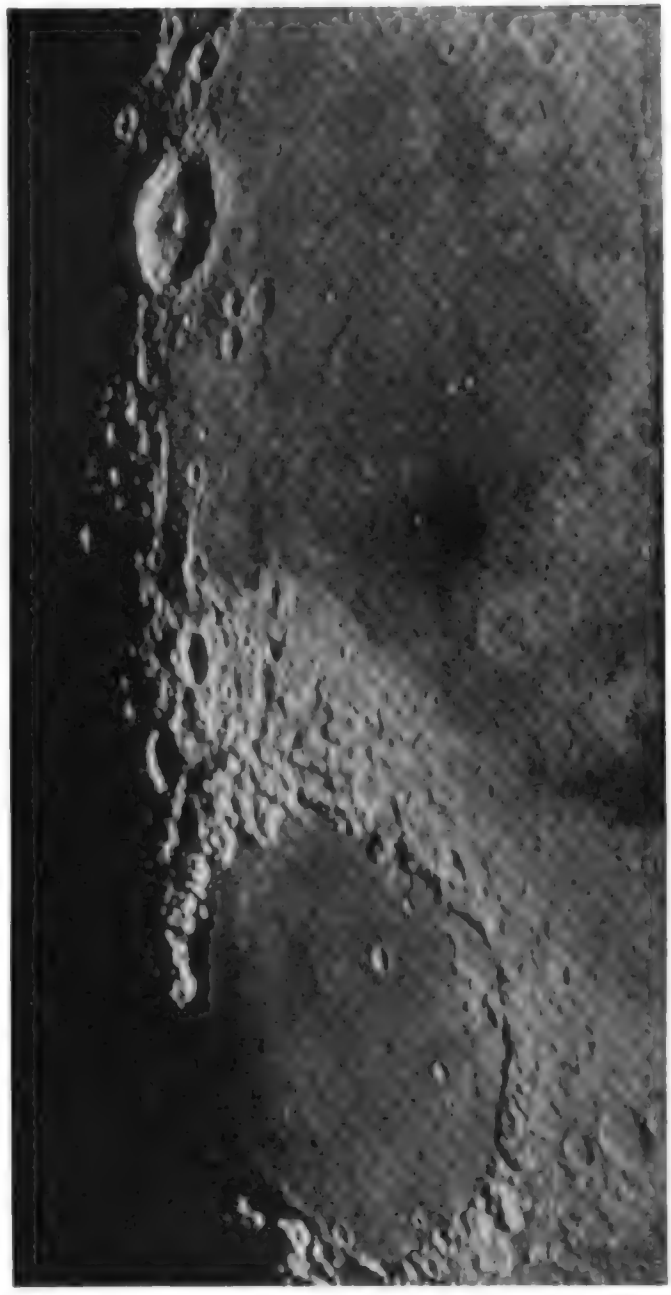
With the aid of an appropriation from the Santa Clara County Board of World's Fair Commissioners an exhibit of transparencies and photographic prints was prepared for exhibition

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at Chicago in the Santa Clara County space of the California building. At the Midwinter Fair this exhibit was displayed in the Santa Clara County building.

The Regents of the University directed that the Observatory prepare a second exhibit to be displayed at the Midwinter Fair in the space allotted to the University of California, since the Observatory is one of the departments of the State University. This second exhibit is somewhat fuller than the exhibit at Chicago, as many new negatives have been obtained since June, 1892, when the first exhibit was completed. The chief features of both these exhibits are framed glass transparencies of astronomical and other negatives made by the astronomers of the Observatory, and also enlargements from these negatives made either at Mount Hamilton, or by foreign astronomers and experts.

Each picture bears a label which gives the necessary information regarding it. Copies of many of these negatives can be purchased from the leading photographers of San Francisco and San José. Attention is particularly directed to photographs of the solar coronas of 1889, January; 1889, December; and 1893, April, by Messrs. Burnham, Schaeberle and Barnard; to photographs of the moon, in the focus of the large telescope, taken by various astronomers; to the very successful enlargements of these negatives, made by Baron Rothschild of Vienna, Professor Weinek, Director of the Observatory of Prague, Victor Nielsen of Copenhagen, and by Mr. Colton of the Lick Observatory. These enlargements are of various scales, from the moon's diameter equal to ten feet downward; to photographs of the milky way and comets, by Professor Barnard; to star maps in both the Northern and Southern hemispheres; to photographs of nebulæ, and especially to pictures of the total solar eclipse of April, 1893, by Professor Schaeberle; to photographs of drawings of Mars and of comets, by Professor Hussey; to spectrum photographs and drawings by Professor Campbell; to photographs (enlarged) of Jupiter, taken with the large telescope; to photographs of the sun and sun spots, taken by Mr. Perrine, and to views of the Lick Observatory, its instruments and its surroundings, taken by all the astronomers.



LUNAR LANDSCAPE

In every other art a long apprenticeship is served; in photography the buying of a camera is supposed to be all that is wanted, and that is what lowers photography and drags it through the dust, and makes it scoffed at by artists and scientists when it is mentioned as a means to an artistic end.—J. S. Bergheim.

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NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER III.

(*Continued from page 188.*)

Art Principles Deduced from the Data Cited.

We have shown why the human eyes do not see nature exactly as she is, but see instead a number of signs which represent nature, signs which the eye grows accustomed to, and which from habit we call nature herself. We shall now discuss the relation of pictorial art to nature, and shall show the fallacy of calling the most scientifically perfect images obtained with photographic lenses artistically true. They do not give a true impression of the scene, as we have shown, and shall again show, but what is artistically more true is really what we have all along advocated: that is, that the photographer must so use his technique as to render, *as far as possible*, a true impression of the scene. The great heresy* of "sharpness" has lived so long in photographic circles because, firstly, the art has been practiced by scientists, and, secondly, by unphilosophical scientists, for all through the lens has been considered purely from the physical point of view, the far more important physiological and psychological standpoints being entirely ignored, so that but one-third of the truth has been hitherto stated.

To begin with, it must be remembered that a picture is a representation on a plane surface of limited area of certain physical facts in the world, arouud us, for abstract ideas cannot be expressed by painting. In all the works in the world the painter, if he has tried to express the unseen or the supernatural, has expressed the unnatural. If he paints a dragon, you find it is a distorted picture of some animal already existing; if he paints a deity, it is but a kind of man after all. No brain can conjure up and set down on paper a monster such as has never existed, or in which there are no parts homologous with some parts of a living or fossil creature. We defy any man to draw a devil, for example, that is totally unlike anything in existence. All so-called imaginative works fall then within the category of the real, for they are in certain parts real because they are all based on realities, even though they may be utterly false to the appearance of reality. By this we mean that an ideal dragon may be based on existing animals; his form may be a mixture of a cobra, saurian, and a mammal, as is often the case; so far it may be real, but then the way in which it is painted must be false, for the natural effect of light and atmosphere on the dragon may and probably will be ignored, for there is no such animal to study from. The modern pre-Raphaelites are good examples of painters who painted in this way; they painted details, they imitated the local colors and textures of objects, but for all that their pictures are as false in impression as false can be, for they neglected those subtleties of light and color and atmosphere which pervade all nature, and which are as important than form. Children and savages make this same error; they imitate the local color, not the true color as modified by light, adjacent color, and atmosphere. But what the most advanced thinkers of art in all ages have sought for is the rendering of the true impression of nature.

Proceed we now to discuss the component parts of this impression.

When we open our eyes in the morning the first thing we see is light, the result of those all-pervading vibrations of ether. The effects of light on all the objects of nature and on sight have been dealt with in the beginning of this chapter, it only remains, therefore, to deduce our limits from these facts. In the first place, from what has been said in that section, it is evident we cannot compete with painting, *e.g.*, we are unable to pitch our pictures in so high a key as the painter does, and how limited is his scale has been shown, but by the aid of pigments he can go higher than we can. It has been shown, too, that it is impossible to have the values correct *throughout* a picture, for that would make the picture too black and untrue in many parts. This fact shows how wrong are those photographers who maintain that every photograph should have a patch of pure white and a patch of pure black, and that all the lighting should be nicely graduated between these two extremes. This idea arose, no doubt, from comparing photography with other incomplete methods of translation, such as line engraving, or from following the old ideas of correct *values* throughout the scale, is an impossibility.

The real point is that *the darks of the picture shall be in true relation*, and the high lights must take care of themselves. By this means a truer tone is obtained throughout. Now, to have these tones in true relation, it is of course

* This heresy I claim that this book hushed for ever. 1897.

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THE MADONNA.

BY J. B. SCHRIEVER.

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implied that the local colors must be truly rendered, yellow must not come out black, or blue as white, therefore it is evident that for highly colored objects color-corrected plates are necessary. But such plates are useless when the quantity of silver in the film is little, for the subtleties of delicate tonality are lost, which are not compensated for by gain in local color, and this is a point the makers of orthochromatic plates must take into consideration. It will be seen now why photographs of brightly colored objects on uncorrected plates (even when the greatest care and knowledge in using them is exercised), are not, as a rule, perfectly successful, and why the ordinary silver printing-paper is undesirable, for it exaggerates the darkness of the shadows, a fatal error. False tonality destroys the sense of atmosphere; in fact, for the true rendering of atmosphere, a photograph must be relatively true in tone; in other words, the relative tones, in shadow and half shadow, must be true. If a picture is of a bright, sunlit subject, brilliancy is of course a necessary quality, and by brilliancy is *not* meant that "sparkle" which so delights amateurs. Of course, the start of tone is naturally made from less deep shadows, when the picture is brightly lighted, for the black reflects light, and all the shadows are filled with reflected light. It will be seen, therefore, that it is of paramount importance that the shadows shall not be too black, that in them shall be light, as there always is in nature—more, of course, in bright pictures, less in low-toned pictures—that therefore the rule of "detail in the shadows" is in a way a good rough-and-ready photographic rule. Yet photographers often stop down their lens and cut off the best modeling light, as well as valuable aberrations, at the same time sharpening the shadows and darkening them, and throwing the picture out of tone. It cannot be too strongly insisted upon that "strength" in a photograph is not to be judged by its so-called "pluck" or "sparkle," but by its subtlety of tone, its relative values in shadow and middle shadow, and its true textures and modeling. Photographers have been advised by the mistaken to spot out the "dotty high lights" of an ill-chosen or badly-rendered subject to give it "breadth." Such a proceeding, of course, only increases the falsity of the picture, for the high lights, as we have shown, are never high enough in any picture, and if a man is so unwise as to take a picture with "spotty lights," he is only making matters worse by lowering the high lights, which are already not high enough. This does not, of course, apply to the case where a single spot of objectionable white fixes the eye and destroys harmony, but to the general habit of lowering the high lights in a "spotty" photograph. Spotty pictures, in art as well as in nature, are abominations to a trained eye, and it is for that very reason that such subjects are more common among photographers who are untrained in art matters than in the works of even third-rate painters. The effect of the brightest sunlight in nature, for reasons explained, is to lessen contrast and give the subject breadth, and the effect of a sharply focused, stopped-down photograph is to abnormally *increase* contrast in the unseparated planes and flatten the modeling, and thus falsify the impression. As the tendency of "atmosphere" is to grey all the colors in nature more or less, and of a mist to render all things grey, it follows that "atmosphere" in all cases helps to give breadth by lessening contrast. As shown in the previous chapter, this aerial "turbidity," by which is meant atmosphere, takes off from the sharpness of outline and detail of the image, and the farther off the object is, the thicker being the intervening layer of atmosphere, the greater is the turbidity *ceteris paribus*, therefore, from this fact alone, objects in different planes are not and should not be represented equally sharp and well-defined. This is most important to seize—as the* prevalent idea among photographers seems to be that all the objects in all the planes *should be sharp at once*, an idea which no artist could or ever did entertain, and which nature at once proves untenable. The atmosphere in the main rules the general appearance of things, for if this turbidity be little, objects look close together, and under certain conditions are poor in quality.

In addition to tone and atmosphere, he must consider "drawing;" but by choosing a suitable lens, and using it correctly, our drawing is done as well as it can be done by an instrument, so that we need not regard this matter of form. A minor aid to rendering depth is the illumination of the object, a lateral illumination giving the greatest idea of relief, but the photographer should be guided by no so-called "schemes of lighting," because, for more important reasons, it may be advisable to choose a subject lighted directly by the sun, or silhouetted against the sun. All depends on what is desired to be expressed. For example,

* This and much other matter now no longer obtains, as many photographers have adopted and practices the original teachings of this book.

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a photographer may wish to express the sentiment and poetry of a sunset behind a row of trees. Is he to consider the minor matter that there will be little relief, and is it not a good "scheme of lighting"? No, certainly not, otherwise he must forego the subject. Nature ignores all such laws. The only law is that the lighting must give a relatively true illusion of the subject expressed, and that a landscape must not be lighted by two or more suns. In portrait work, even, it must be remembered that the ærial lighting must stand out against the background, for in all rooms there is a certain amount of turbidity between us and distant objects.

The reason we prefer pictures which are not too bright lies in the fact that the eye cannot look long at very bright paintings without tiring. As a physical fact, too, the most delicate modeling and tonality is to be obtained in a medium light. From what has been previously said, it will now be understood that a picture should not be quite sharply focused in any part, for then it becomes false; it should be made just so sharp as will best give the *appearance* of nature from one point of sight, *and no sharper*, for it must be remembered that the eye does not see things as sharply as the photographic lens, for the eye has faults due to dispersion, spherical aberration, astigmatism, ærial turbidity, blind spot, irradiation, etc., and beyond twenty feet it does not adjust perfectly for the different planes. All these slight imperfections make the eye's visions theoretically more imperfect than that of the optician's lens, even when objects in one plane only are sharply focused, therefore, except in very rare cases, which will be touched upon elsewhere, the chief point of interest should be slightly—very slightly—out of focus, while all things, out of the plane of the principal object, it is perfectly obvious, from what has been said, should also be slightly out of focus, not to the extent of producing *destruction of structure* or fuzziness, but sufficiently to keep them back and in place. For, as we have been told, "to look at anything means to place the eye in such a position that the image of the object falls on the small region of perfectly clear visions, and whatever we want to see, we look at, and see it accurately; what we do not look at, we do not, as a rule, care for at the moment, and so do not notice how imperfectly we see it," though this does not in all cases hold as a hard and fast rule. Such usually is the case, as has been shown, for when we fix our sight on the principal object or *motif* of a picture, binocular vision represents clearly by direct vision only the parts of the picture delineated on the points of sight. The rule in focusing, therefore, should be, focus for the principal object of the picture, but all else must not be sharp; and even that principal object must not be as perfectly sharp as the optical lens will make it. It will be said, but in nature the eye wanders up and down the landscape, and so gathers up the impressions, and all the landscape in turn appears sharp.* But a picture is not "all the landscape," it should be seen at a certain distance, twice the breadth of the picture being the rule, and the observer, to look at it thoughtfully, *if it be a picture*, will settle on a principal object, and dwell upon it, and when he tires of this, he will want to gather up *suggestions* of the rest of the picture. If it be a common-place photograph taken with a wide-angle lens, say, of a stretch of scenery of equal value, as are most photographic landscapes, of course the eye will have nothing to settle thoughtfully upon, and will wander about, and finally go away dissatisfied. But such a photograph is unsatisfactory. Hence, it is obvious that panoramic effects are not suitable for art, and the angle of view included in a picture should never be large. It might be argued from this, that Pseudo-Impressionists who paint the horse's head and top of a hansom cab omitted all suggestions are correct, since the eye can only see clearly a very small portion of the field of view at once. We assert, no, for if we look in a casual way at a hansom cab in the streets, we see only *directly* the head of the horse and the top of the cab, yet, indirectly, that is, in the retinal circle around the *fovea centralis* we have far more suggestion and feeling of horse's legs than the eccentricities of the Pseudo-Impressionist school give us, for in that part of the retinal field indirect vision aids us. The field of indirect vision must be *suggested* in a picture, but subordinated. But we shall go into this matter later on, here we only wish to establish our principles on a scientific basis. Afterwards, in treating of pictorial questions, we shall simply give our advice, presuming the student has already studied the scientific data on which that advice is based. All good art has its scientific basis. Sir Thomas Lawrence said, "Painting is a science, and should be pursued as an inquiry into the laws of nature. Why, then, may not landscape painting be con-

* This objection has been fully answered elsewhere.

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sidered as a branch of natural philosophy, of which pictures are but experiments?"

Some writers who have never taken the trouble to understand even these points, have held that we admitted fuzziness in photography. Such persons are laboring under a great misconception; we have nothing whatever to do with any "fuzzy school." Fuzziness, to us, means *destruction of structure*. We do advocate broad suggestions of organic structure, and artistic focus of relative planes, which is a very different thing from destruction, although, there may at times be occasions in which patches of "fuzziness" will help the picture, yet these are are rare indeed, and it would be very difficult for anyone to show us many patches in our published plates. We have, then, nothing to do with "fuzziness," unless by the term is meant that broad and ample generalization of detail, so necessary to pictorial work. We would remind these writers that it is always fairer to read an author's writings than to read the irresponsible constructions put upon them by prejudiced persons.

CHAPTER IV.

Naturalistic Photography and Art.*

Before proceeding further, it will be well to give an epitome of the past matter, we shall do this in the following chapter.

When I first took up photography I was told by the whole photographic world (including optical experts); told by all, without exception, that if the photographic observer closed one eye and placed the other eye at the focal distance of the lens used in taking the photograph under observation, he would see the picture "true to nature."

I felt all along that such was *not* the case, and maintained the "sharp" or any other photograph when viewed under such conditions was not true to nature—to nature as the *two eyes* see it, and hence arose a long and inky warfare.

Gentlemen, it was in this as in many other disputes—we were both right and we were both wrong.

The opticians were right from the mathematical standpoint, and I was right from the physiological and psychological standpoints, and so it was evident there were two truths to nature—the perspective or mathematical truth and the psychological or visual truth. After many practical experiments I found the closest truth to nature in photography (*from the physiological point of view*) was to be obtained by throwing the background of the picture out of focus to an extent which did not produce *destruction* of structure—that was my limit; the principal object of the picture being either sharp or just out of the "sharp." This convention I termed the naturalistic method of focusing, and pointed out that it had no connection with a general *soft sharpness* such as that produced by Mrs. Cameron's badly-corrected "Jamin lens," or by pin-holes, or by throwing the *whole* of the picture out of focus—practices all inferior from the naturalistic standpoint, in my opinion, to my focusing method—which is a deliberate and conscious act to be modified according to circumstances, and no haphazard "dodge" like the "soft sharpness" or "bastard naturalism," as my friend Mr. Balfour calls the more mechanical "soft sharp" method.

This naturalistic method of focusing I practised and advocated and found later on by further research that it was justified by physiology. Well, gentlemen, all this led to a great storm in a tea-cup, and disputes arose as to how we did see with two eyes and what was really *truth to Nature* from the visual standpoint. In the course of this argument I was pleased to find a broad-minded optician taking an interest in these matters. I refer to my friend Mr. Dallmeyer, whose acquaintance I did not make till after the publication of my book.

Well, gentlemen, this argument—though warm at times—did good, and set many thinking, and at last I was lucky enough to drop upon the key to the solution, which key I published in April, 1890, in a number of *Photography*. It was a short paper entitled, "A Note on Naturalistic Focusing." My friend, Mr. Goodall, who was formerly interested in the practice of photography, was told by me of this little research, and immediately he took it up enthusiastically and suggested some new proofs and experiments, and together we published the results in a pamphlet entitled, "Perspective Drawing and Vision,"* a pamphlet that created another storm in the tea-cup, but a pamphlet whose propositions, I venture to say, still remain unshaken, though the Royal Astronomer at Sydney was invited to a public argument in the *Photographic News*—a challenge still open to him or any other person of physiological or psychological training: and here I

* A paper read before the Photographic Society of Great Britain, March, 1893, revised.

* Reprinted in the chapter on "Sight."

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MOONLIGHT ON THE HUDSON BY CARL WOLFF

may say Dr. Griffiths and Mr. Sutcliffe were the only two photographers who were, at the time, acute enough to see and acknowledge in public the full force of the pamphlet.

Well, gentlemen, from this pamphlet it was again self-evident to me that there is no *absolute* truth to Nature from the visual standpoint, for as each man's sight is different, the only absolute truth to Nature for each man is his own view of her (though certain broad features remain true to all). On the other hand, from the mathematical standpoint or perspective drawing standpoint, there is an absolute standard, such as the sharp photograph taken with rectilinear and otherwise duly corrected lenses.

Now, gentlemen, I will quote you a paragraph from a text-book on Psychology, published only last year (1892), a passage which shows how this view is now so far accepted that it has entered psychological text-books for students. The quotation is:

"Almost all the VISIBLE shapes of things are what we call perspective *distortions*. Square table-tops constantly present two acute and two obtuse angles, circles drawn on our wall-papers show like ellipses, etc., and the transitions from one to another of these altering forms are infinite and continual."

That, gentlemen, is the position. Whence it is again evident that NO photograph gives things as we *see them* with our two eyes, though some photographs give results NEARER to what we see than others, and those are the naturalistic photographs.

The next question I put to myself was: How true must the photograph be so that it may be considered naturalistic? And this gave me much trouble, but at last I think I can offer the solution, which is,—It must be true in fundamentals to the point of *illusion*. Thus, a man's boots must not be twice as big as his head, and so on with everything.

So, gentlemen, what I advocate is truth to the point of illusion (for I am not considering to-night scientific photographs but pictorial photographs). And I may now say the methods of practice I advised in *Naturalistic Photography* I still advise, and the bulk of artists I held up for admiration in that work I still hold up as the best exemplars of their various crafts, but I do not consider photography an *art* but regard it as a mechanical (I say "*mechanical*" advisedly)

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process, whose results are sometimes more beautiful than art, but are never art, just as Nature is often more beautiful than art—just as the beautiful Japanese *lilium auratum* surpasses the painted lily—yet is the real lily not art but Nature. So the photograph is not art, but a mechanically recorded reflection of Nature. To state this matter more clearly I have adopted a genealogical form of presentation.

NATURE.

(The fountain-head of sensuous impressions, but not necessarily of *ideas*.)

PHOTOGRAPHY.

(A cross between *Nature* and a *machine*.)

Realism.	*Naturalism.*
(The sharp photograph—wherein sentiment, illusion, and decoration are disregarded; merely a register of bald facts mathematically true.)	(The more or less correct reflection of Nature, wherein truth of sentiment, illusion of truth (so far as possible), and decoration are of first importance.

From which it is self-evident that I believe there is no true realism nor naturalism in the arts proper but only in *photography*: for TRUE realism and naturalism are *impersonal*—the results of a mechanical process which photography logically is, because under the same *physical* conditions the same *results* will always follow. Place the camera under certain physical conditions and the same results will always follow, which is *not* the case with art, which is *personal*; indeed, the personal element in real art is paramount and all-pervading. Thus, art is a cross between *Man* and Nature, or—

ART.

(Cross between Man and Nature—no machine intervening)

Impressionism.	*Idealism.*
(Which is a purely *personal* vision of Nature as thus an impressionist may paint *sharply* or may paint colors wrongly from defect of vision: as does Manet.)	(Cases in which the imagination is used; that is, the combining of several ideals into one harmonious whole. The idealist may transcend *known* Nature and so the vase is produced.

In brief, what I submit is that all *artists* (who do not use photography, and such are bastards) are either impressionists or idealists, and that logically they *cannot* be either realists or naturalists, for they can never be truly *impersonal*. M. Zola *calls* himself a "naturalist," but he is not, as Mr. Thomas Hardy has pointed out: were I to classify him it would be as a morbid impressionist. On the other hand, M. Viaud, a far more sensitive artist, has been called a "naturalist;" he has publicly denied it, calling himself an "idealist," which he is not—he is an impressionist; morbid, too, in his way. On the other hand, Theocritus I should call a sane impressionist, and Milton an idealist,—or to put it into paint, Mr. Whistler is a sane impressionist and Rossetti an idealist.

And there can be insane impressionists and idealists, as lunacy students know, as well as mattoid impressionists, as was the late Richard Jefferies in literature, and, say, Prout in art.

But still there is a link binding Nature, Art, and Photography together—a touch of kinship—and that is *decoration*. The artist admires Nature when she "sings in harmony," *i.e.*, is *decorative*; he admires the photograph when it "sings in harmony," *i.e.*, is *decorative*, and he admires works of art when they "sing in harmony," *i.e.*, are *decorative*.

Thus, photographs must be *decorative* to appeal to artists, but that does not make them *art* any more than Nature is art when she is decorative. In a word, art is the personal expression of a personal vision of Nature or ideal. A decorative photograph is a mechanical reflection of Nature *when* she "sings in tune," the good photographer requiring to know when Nature does "sing in tune." In a word, he must have true perception of the beautiful to succeed, after that he is merely the starter of a machine.

If you will allow me to digress for a moment let me here make a reservation. It is that it matters not, for *merely* decorative purposes, what lens be used or how it be used, what exposure be given or how it be given, what developer be used or how it be used, what printing method be adopted or how it be handled, *provided* always the result be *decorative*, for no photograph can be said to have any "art qualities" (this does not allow it can be art) without being first of all decorative—a harmonious whole. That is the first quality which differentiates the few photographs from the thousand. But there are higher qualities, degrees of interest and distinction, as it were, and to possess these it must be illusively true, and fine in its *natural* sentiment, as well as decorative; in a word "naturalistic." And even Mr. Whistler (a

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far greater artist than philosopher) gives himself away upon this very point in what I years ago called his brilliant but illogical "Ten o'clock," though such an acute critic as Mr. Henley has called this lecture the greatest art writing of the century, which I submit it is not. In this "Ten o'clock" Mr. Whistler advocates throughout his work art for art's sake (*i. e.*, pure decoration) as the be-all and end-all of art. But I submit that he gives his case away when he writes:—

As did her high-priest Rembrandt, when he saw NOBLE DIGNITY *in the Jew's quarter of Amsterdam.*"

Or—

"To the day when she dipped the Spaniard's brush in light and air, and made his people . . STAND UPON THEIR LEGS, that all nobility and sweetness, *and tenderness and magnificence should be theirs by right.*"

Gentlemen, "noble dignity," "tenderness," &c., have *nothing* necessarily to do with decoration, but they are the ALL-ESSENTIAL qualities for fineness of sentiment in the pictures cited.

It was on this very point that our greatest poet, Mr. Swinburne, fell foul of Mr. Whistler and got worsted. I venture to think, had Mr. Swinburne merely quoted these and similar passages his position would have been invulnerable, but he must argue. Indeed, truth of sentiment and fineness of sentiment are distinctly advocated as virtues in these passages and as I have always claimed them to be, and so what becomes of *l'art pour l'art* theory and the contention that "subject" has nothing to do with it. I have always maintained "subject" is as necessary as decoration for the perfect work, and I still maintain it; but "subject" is often confounded with "story-telling."

What is wanted in naturalism is a decorative illusion of Nature, a decoration embodying some fine and true *natural* sentiment, the decoration without the sentiment (not sentimentality) is a mere sensuous patch-work of color, the sentiment without the decoration is mere "literature in the flat," and the truthful illusion without either sentiment or decoration is a mere statement of fact, which explains why Mr. Whistler's masterly "Carlyle" must always be of more *interest* than, say, a "still-life" picture by the same hand.

(*To be continued.*)



"WHICH WAY?" BY THOS. HINDLE

THE NEW PHOTOGRAPHY, OR PHOTOGRAPHING THE INVISIBLE. BY JOHN CARBUTT.*

THE subject for your consideration this evening is the "New Photography," or "Photographing the Invisible," and before entering on the main part of my subject, I will briefly trace the history of photography, and what it has accomplished in a little over the latter half of the 19th century just closing. While most of the earlier processes of photography are of foreign origin, Americans have been the most prompt to adopt and improve on those methods. And I claim for Philadelphia and her citizens the distinction of having fostered and encouraged the beautiful art of photography more than any other city in the Union. The Daguerreotype, named after the discoverer, Daguerre, a citizen of France, was first announced to the world in 1839. The next was the Talbotype, the discovery of Henry Fox Talbot, of England, in 1841, afterwards called the Calotype, and was used mainly in taking landscape views. Next came the albumen process. Whipple of Boston, and the Langenheim Brothers of this city were the first to adopt the process in America, that is, of making negatives on glass, and transparencies for the stereoscope and magic lantern. The Langenheim Brothers bought the American patent for the Talbot process, and improved upon it by substituting glass for paper, using albumen as the vehicle to hold the sensitive salts, and called the process "Hyalotype." They were the first to make transparencies on glass for the stereoscope and magic lantern. Robert Hunt, in an article in the *Art Journal* of April 1st, 1851, on "Improvements in Photography," says: "We have before us a series of these magic lantern slides, the hyalotypes, and we feel bound to declare that their delicacy and perfection of the details cannot be over-estimated." M. Le Gray was the first to suggest the use of collodion in photography, but Mr. Scott Archer, of London, was the first to successfully apply it, and in 1851 published a treatise on the making of glass positives. In America, where the process was speedily adopted, they were called ambrotypes. The same chemical process was used in the making of negatives, and continued in use until the advent of the gelatine bromide process. Dr. R. L. Maddox, of London, in 1871 substituted a solution of gelatine for collodion to hold the sensitive salts of silver, gave his formula to the world, and the process was speedily taken up by numerous skilled amateurs in England, and by 1876 the professional photographers of England had, owing to the greater sensitiveness of the gelative plate, begun to use it in their practice. The first to make a gelatine dry plate in this country, that I have any knowledge of, was Mr. Geo. W. Hewitt, a skilled amateur of this city and member of this society, and the first dry plate factory in America was established in this city by myself in 1878, and by 1880 the dry plate began to displace the wet collodion process, which has long since ceased to be used in portraiture and landscape photography. In 1885 I introduced the orthochromatic dry plate, the use of which, with suitable color screens, has led to the reproduction in colors of objects in art and nature by the three-color process of printing, with remarkable fidelity. Most of you are of course familiar with the exquisite and truthful representation of nature by Mr. F. E. Ives, a member of this society. I might continue to the end of the time alloted me in relating photographic methods of the past and present, many of which I have to pass unnoticed. It is but a little over a year since Prof. Roentgen gave to the world his great discovery of the X-rays, by which it is now possible to photograph the invisible anatomy of the human body, and on the 27th of January of last year the first Radiograph was taken in America by Prof. Arthur W. Wright, of Yale University, one day after he had read of the Roentgen discovery. In passing thus to the practical consideration of the X-ray, I will not attempt to enter into a description of the scientific aspect of the Roentgen phenomena, that has already been so fully and ably described by Prof. Houston, in his lecture on the eve of October 30th last, at the Franklin Institute, and by Professor Arthur W. Goodspeed, of the University of Pennsylvania, before this society, who early in February of last year made investigation of the Roentgen phenomena, as did also Professor Pupin, of Columbia College, and Professor W. F. Magie, of Princeton, and others. I at once took an interest in the discovery, and conceived the idea that a specially prepared plate would be required to suit the mysterious X-rays, and on February 11th of last year, at the Maternity Hospital, Prof. Magie exposed the first X-ray plate, the case being that of a burned hand with anchylosis of the fingers, one of Dr. W. W. Keen's patients, and the exposure given was 20 minutes. The negative

* Read before the Photographic Society of Philadelphia.

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showed full detail of bone structure of the hand.

On the same day two of the same kind of plates were exposed by Prof. Goodspeed, at the Physical Laboratory of the University, on objects, time of exposure 21 and 30 minutes respectively, and both proved to be fully exposed; previously exposures to the X-rays had ranged from 60 to 120 minutes. With improved apparatus and further improvements in the X-ray plates, exposures now range from a few seconds to 30 to 60 minutes, depending on the thickness of the part of the body to be radiographed. I will now make an exposure on one of my X-ray plates, simply enclosed in a double envelope, this allows of the object to be radiographed being close to the sensitive plate, the exposure will be 90 seconds, with lower side of tube 12 inches from the plate. I will now ask the President to let me radiograph his hand, the one lacking a finger, which my son will develop, and later can be seen by you. As confirmation of my previous assertion that Philadelphia leads in the application of any new improvement in, or use of, photography, I will quote from a work on X-rays, by Edward P. Thompson, M.E.E.E., page 178, where he says: "In the race to excel in this new art, no one, to the author's knowledge, has surpassed Prof. Goodspeed, of the University of Pennsylvania, considered jointly from the standpoint of priority, superiority, quantity and variety." Of that you had ocular evidence last fall at the lecture given here, and profusely illustrated by Prof. Goodspeed. The hospitals of Philadelphia and other cities are rapidly installing X-ray apparatus, and the surgeons in charge are making most valuable use of the Roentgen rays in diagnosing cases of fractured bones, and locating foreign substances, and there are instances where the use of the X-rays has been the means of saving life, notably in two cases in this city, where foreign substances had been swallowed and lodged in the œsophagus. In the first case a little girl of five years swallowed a jackstone, and the location of same was revealed by a radiograph taken by Prof. Goodspeed, and the jackstone was successfully removed by Dr. W. H. White, with the speedy recovery of the patient. The second, and most recent, was the location of a small iron staple in a man's throat, that had formed one of the ingredient of a mince pie he had partaken of. Radiographed by Dr. Max Stern, of the Polyclinic Hospital, and successfully removed by Dr. Bliss. In orthopædic surgery, the use of the X-ray apparatus is of great value in diagnosing the malformation of the bones.

The following hospitals in Philadelphia have X-ray installation: The Polyclinic, in charge of Dr. Max J. Stern; the Jefferson Medical College, in charge of Dr. M. W. Coplin; the Pepper Clinical Laboratory, in charge of Dr. Chas. L. Leonard; the Medico-Chirurgical, in charge of Dr. E. La Place, and the Episcopal Hospital. The apparatus for the successful production of radiographs consists of, first, an Induction coil, second a Crookes' tube, third an electric current, which may be obtained from a dip battery having six or more cells coupled in series, or from a 110 volt incandescent current, controlled by a rheostat, or third, and preferably, a storage battery. This outfit I have here is of the modern type, the induction coil being capable of giving an 8-inch spark in air and excited by the current from two chloride accumulator storage batteries of 16 volts, the large Leyden jar is used as a safety valve, by allowing one of the conducting wires from the coil to pass the current through it, and make a small spark gap, so that in case of a sudden increase of the current, the jar would act as a condenser and prevent injury to the Crookes' tube. The condenser of this coil has large capacity, and divided into ten divisions, controlled by a fan-shaped contact, and was made to order for me by C. F. Splitdorf, of New York. It has an improved vibrator that allows the use of a tube of low vacuum to one requiring fully a 7-inch spark to force the current through, and the vibration can be adjusted to give a moderately fast or very fast make and break contact. Of the Crookes' tubes we no longer have to look to foreign makers for a supply, as again American genius shows its capabilities in supplying quickly, and of the best, there being seven or more makers of Crookes' tubes in the United States. I have here samples of several makers, each differing in construction, and all capable of generating a good quality of X-rays. The Crookes' tube, I may here say, is the most essential part of the outfit, and requires the greatest care in its use. In procuring a new tube I advise that its vacuum should be for not more than half the spark-capacity of the coil it is to be used upon. For instance, if you are using a 6-inch spark coil, the tube should readily fluoresce with a three or three and a half inch spark, for after being used a few times it will be noticed that the vacuum has gone higher and more tension is required on the vibrator to produce the full

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RADIOGRAPH OF HAND

Showing amputation of Finger and fragment of cartridge-shell embedded for eighteen years, but just discovered by X-rays.

Negative made before the members of the Photo. Soc., of Phila., March 10, 1897, by John Carbutt 90" exposure on Carbutt's X-ray plates.

amount of fluorescence and good X-rays. There are various devices added to the Crookes' tubes for the purpose of lowering the vacuum when it gets too high for the current to flow through the tube readily, of these I have three examples. This one, made by the Edison Lamp Co., of Harrison, N. J., has an auxiliary tube containing at the end a substance that when gently warmed gives off vapor that lowers the vacuum and enables the current to again pass at the voltage the coil is supposed to be used at. This one, made by Emil Greiner, of New York, has a small incandescent lamp enclosed in the stem, which, when connected to a four or six volt battery, and allowed to burn for a minute or two, will lower the vacuum when too high. This tube I will use later in illuminating the fluorescent screen. This one was made by Queen & Co., of this city, and has also an auxiliary tube containing a chemical salt that when heated lowers the vacuum. A tube without these adjuncts for lowering the vacuum may for a long time be made to give off good X-rays by carefully heating the cathode end with a spirit or gas flame. In using the tube it is well not to let the anode become heated beyond a small, cherry red space not exceeding a quarter of an inch, for it is the heating of the anode that so quickly raises the vacuum, and the distance at which the lower side of the tube should be from the sensitive plate, very materially affects the time of exposure and the result. Eight inches to ten or twelve is near enough for a hand, the shorter for a small hand, and the latter for hand and wrist, or forearm, bearing in mind that the exposure must be increased as the square of the distance. For instance, an exposure with the tube six inches from the plate, we will give say, 30 seconds; at 12 inches, 120 seconds; at 18 inches, 270 seconds would be about right. It is with diffidence that I speak of the photographic plate to be used for X-ray work as I am personally and commercially interested in its production, therefore I will speak generally of what I consider, after much study and experience, the dry plate suited to the use in radiography. It should be of medium sensitiveness, have a good body of emulsion, be capable of absorbing the X-rays, thereby giving more detail and perspective to the bones. For developer, one capable of searching out detail and at the same time capable of giving density, and not apt to stain the plate by long development. Pyro I would exclude for this class of work. Eikonogen with hydrochinone mixed is good, or used separately. I may say, however, that the developer most generally used with my X-ray plates, is the J. C. Tabloids I put up. The plates should, during development, be covered over, and development continued for six to ten minutes, until, if possible, a trace of the image can be seen on the back. After developing and well rinsing off, the plate should remain in the fixing bath for not less than 20 minutes, and all solutions should not be used below 60 deg, Fahr. I will now have shown on the screen a few examples of radiography, and the first is that of an infant four days old, taken after death, showing the lack of ossification of the joints; 2 and 3, the mummy hand and foot of an Egyptian princess, radiographed 3,500 years after death; 4, a rat after being killed by a terrier; 5, a crab; 6, a congor eel; 7, quail; 8, hand of lady musician; 9, interior dislocation of radius; 10, comminuted fracture of both bones of forearm; 11, tumor on hand; 12, an artificial spectrum made up of strips of colored screens, such as I make

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for use in photographing paintings. I show this slide to demonstrate that while the colors are transmitted and shown in all their brilliancy on the screen by the light received from the same source that energizes the induction coil and produces the X-rays, when I place the same artificial spectrum behind the fluorescent screen, you will observe that the X-rays absorb all the colors of the spectrum, and no color sensation reaches the eye any more than the piece of plain glass above the artificial spectrum. This I believe to be the first time such phenomena have been demonstrated in public, and until Dr. Roentgen or another able scientist proves otherwise I shall continue to believe that the X-rays are the ultra-ultra-violet. This screen I prepared, to show to the audience the hand and arm, and will now have the lights extinguished the better to observe the effect, with which I close my lecture, and thank you for your patient attention.

ROSE DES ALPESAND ALIZARIN BLUE BISULPHITE AS ORTHOCHROMATIC SENSITIZERS.

BY MILTON B. PUNNETT.

Rose des Alpes (Thiodichlortetraiodo fluorescine) and alizarin Blue Bisulphite have been recommended, according to reports, by Dr. Eberhard of Gotha as color sensitizers. The following is said to be his formula:

Water		100 c. c.
Alizarin Blue Bisulphite	(1 : 500)	100
Rose des Alpes	(1 : 200)	2
Ammonia	(sp. gr. 0.91)	1
Silver Nitrate	(1 : 40)	46 drops.

As the alizarin Blue Bisulphite is a pasty mass, in making up my stock solution, I took a little more than the formula called for to be certain I had enough. It did not seem to dissolve thoroughly until the ammonia, which was a trifle stronger than the formula requires, was added. Plates were bathed two minutes and dried over night. In daylight they showed greenish yellow streaks.

Tested on a color chart with an aurantia screen they proved foggy and possessed no more color sensitiveness than a regular Seed plate.

In my next experiments I used the following amounts:

Water		500 c. c.
Alizarin Blue Bisulphite	(1 : 1000)	100
Rose des Alpes	(1 : 1000)	100
Silver Nitrate	(1 : 1000)	100
Conc. Ammonia		10

After filtering, some of Seed's non-halation plates were bathed in it under the same conditions as with the previous formula. In testing they were compared with plates bathed under similar conditions in the following bath:

Erythrosine	(1 : 1000)	100
Silver Nitrate	(1 : 1000)	100
Water		500
Conc. Ammonia		10



ROSES BY BYRON V. TOMPKINS



NOVEMBER REFLECTIONS BY GEO. D. FIRMEN

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WINTER BY CARL WOLFF

The above mentioned yellow screen and chart were used and they (the plates) were found to be not quite so color sensitive as the Erythrosine silver plates, with the exception of to the red rays which appeared to act comparatively a trifle stronger than on the Erythrosine plates. Further experiments showed that the sample of Alizarin Blue Bisulphite which I possess has but little color sensitizing power, and that the color sensitizing power of the bath mentioned was due chiefly to the Rose des Alpes which has not, however, in my hands proved as powerful as Erythrosine. Other experiments which I have made I hope to find leisure to narrate in some future number.

While on this subject I would like to call the attention of those interested in the subject to a simple method of distinguishing between Eosine and Erythrosine. Eosine in a dilute solution is red by transmitted light, but greenish yellow by reflected light, that is, it is fluorescent, while Erythrosine is not fluorescent but is red when seen either by reflected or transmitted light.

I speak of this matter because I have a sample purporting to be Erythrosine, and bearing the label of one of the largest dealers and chemical manufacturers and which fluoresces strongly.

AN ADMIRABLE PRINTING PROCESS FOR PHOTO-MICROGRAPHS. BY W. H. WALMSLEY.

The delicate details of a photo-micrograph are undoubtedly shown by a transparent print on glass, in a manner and with a perfection, which can never be reached by any paper print. But since it is impossible to adopt that method to any great extent, it becomes eminently desirable to secure the best available paper process. It is indispensably *necessary* that the surface be smooth and of the finest texture, capable of reproducing the most delicate details of the negative. It is highly *desirable* that it may be printed equally well by day or artificial lights, that it be easily manipulated by the veriest tyro, require no toning, be permanent, and finally of moderate cost.

These various qualities seem to be very successfully combined in a paper introduced (during the past year, I believe), under the name of Velox. It is a bromide emulsion paper, requiring to be developed (as do all of its class), but of so low a degree of sensitiveness that it *may* be handled in the light of an ordinary gas jet, oil lamp or even very dim daylight, without

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"FROZEN OUT" BY RALPH W. ROBINSON

injury. The makers so state in the directions for use accompanying the paper, and I have verified the correctness of the statement. None the less, I would not advise the general adoption of this method, if uniformly good work without degradation of the white be desired. A lamp shaded by a single thickness of post paper is *absolutely* safe, at the same time affording ample light for all necessary manipulations.

In sensitiveness, Velox seems to stand betwixt the bromide and ordinary printing-out or albumen papers, the makers stating that it is five hundred times more rapid than these latter. It can, therefore, be printed by gas or lamplight in very much less time than would be required for them in the light of the brightest day, and a much larger number of prints made in a given time from a single negative ; a matter of no small importance.

Velox paper is made in two grades, "carbon" and "glossy." The former has a smooth, matt surface, seemingly well adapted to landscape portraiture and general photographic work, with which this article has nothing to do. The "glossy" paper has an exceedingly smooth and brilliant surface, bearing up the print without the least tendency to sink in and rendering the most delicate details of a structure—a diatom, for instance,—with *almost* the crispness and brilliancy of a glass transparency. I cannot help wishing that such of my readers, as are interested in photo-micrography, could see some prints I have made recently. These would possibly be a revelation to them of the possibilities in a paper print. The tones are mostly pure blacks of varying degrees of intensity, but rich, warm browns can be readily obtained by slight variations in length of exposure, and in composition and strength of developer.

In my experiment with and use of this papers, several different sources of illumination have been employed, from which the following table was compiled. It should be borne in mind that negatives of ordinary average density were used, very thin or over dense ones requiring correspondingly shorter or longer exposures.

Diffused daylight, bright and clear	1″ or less
Acetylene gas, 1 ft. burner, 7 in. distant	3″
City gas, 6 ft. burner, 7 in. distant	3″
Coal oil lamp, 1 inch wick, 7 in. distant	4½″

As will be seen from the above table, the fortunate possessor of an acetylene light is about as well off as the daylight worker. Really he is better, since the latter light is continually varying, whilst the acetylene remains always the same. But even with ordinary lamps or

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gaslight it is possible to get off at least two dozen finished prints of an evening. No toning being required, they have to be merely exposed, developed, fixed washed and dried. No more; a thing of beauty—and *permanency*—is the reward of a very small expenditure of time, patience, and money; for this paper may be purchased in 4 x 5 or cabinet size (the best for our purpose) at the very moderate price of two dollars per gross, which covers the entire outlay, no gold for toning being required.

Any of the standard developers (except pyro), may be used with Velox paper equally well, so that every worker may choose the one he likes best, or has the greatest experience with. The makers recommend amidol, and with good reason. It is exceedingly satisfactory, giving jet black tones with proper gradation, if the exposure be properly timed. But it is so energetic that extreme care is necessary to prevent over development and consequent flatness. But used cautiously, it is all that can be desired. The same may be said of ferrous oxalate, metol, glycin, and my own "graphol," my preference being for the latter; possibly for the same reason that every mother thinks her own offspring the best.

With any of these developers it is highly necessary to watch the growing image very narrowly and stop the development at exactly the right moment. The makers of the paper recommend throwing the print at once—on this stage being reached—into the fixing bath. I cannot agree with this for several reasons unnecessary to repeat here. My plan is to have ready a bath of acidulated water into which the print is plunged the moment it reaches the proper point, and from which it is transferred to the fixing bath. This and bath acts as a short stop, and it is needless to point out that the fixing bath remains in a *rather* better condition than it would if a lot of developer were dumped into it with each print.

As to the fixing bath, I have never found any use for alum, so generally recommended, and never have anything but a clean, clear, effective bath. The following formula has given the most perfect satisfaction for *all purposes* in the past fifteen years, and I find it equally adapted to the Velox papers.

Sodium hypo-sulphite	16 ounces
Sodium bi-sulphite	4 ounces
Water	2 quarts

This bath will keep clear and active, almost indefinitely. Try it.

Nothing mundane is absolutely perfect, and Velox paper with all its excellencies, has its shortcomings; it is but earthly. The most serious of these, in fact the only one which has given me any trouble, is fortunately easily remedied. I usually mat my photo-micrographs in printing, leaving a blank margin around the picture which should be clear and white, but quite frequently is not. Streaks and stains are but too apt to mar and deface the surface which should be spotless. It would seem that this is an inherent defect in the paper, as the makers give directions in their instruction sheet for removing the stains by means of diluted ammonia. I have not found this method satisfactory, but the usual reducing bath of hypo and potass ferridcyanide, is eminently so. If the print be stained, upon removal from the fixing bath, gently rub it with a tuft of cotton wool moistened with the reducer, and all marks will promptly disappear. Care must be taken not to allow the reducing fluid to run on to the print, and a plentiful supply of water must be at hand for washing it off promptly. A little care will *invariably* give the desired result. After washing for an hour or longer in several changes of water, the prints *may* be removed to a blotting pad, or hung up to dry, which they will do with a fairly good gloss and generally satisfactory appearance. But altogether the best method is to squeegee them upon ferrotype plates, from which, when dry, they will peel off with a transparent gloss revealing every detail of the subject in the most perfect manner, "a thing of beauty and joy forever."

I find that mention of an important item was omitted in the proper place, relating to developers. It is the absolute importance of using potass bromide with any and all of them. Not only *must* it be used, but the proper amount is of almost equal importance. After repeated exp ments I have found that about ten drops of a ten per cent. solution of bromide to the ounce of developer, is as nearly correct in a general way, as we can hope to arrive at.

In conclusion, should any of my readers interested in photo-micrography desire to see a print on this paper, I will be happy to forward one to him, on receipt of stamp to cover cost of postage.

"He who does not ascertain what a picture is before he attempts to produce it is like one who runs a race without knowing either the course or the goal."—*The Art Student.*

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HOW TO AVOID FAILURES IN THE MANIPULATION OF DRY PLATES. ADDRESS BY F. M. WHIPPLE, WISCONSIN STATE CONVENTION.

When I promised yesterday afternoon to give you a little talk on the manipulation of dry plates, I hoped to make some little preparation for same, but my time has been so full (laughter)



A NEGLECTED HIGHWAY BY F. R. RAVEN

—now please don't draw on your imagination, for really it was my time that was full and not myself.

Before starting on the subject assigned I wish to compliment the officers of this Association, and those of you who have helped to make this your first State Convention the splendid success



UN BILLET BY C. PUYO.

that it most assuredly is.

Your magnificent display and this enthusiastic gathering certainly attest to the general good feeling and interest shown, and place your Association in the front rank among State Associations.

I am particularly gratified in this success, as aside from Chicago, Wisconsin is my main stamping ground, and I have a personal pride in your success.

My lack of preparation will make this talk a rambling one, but demonstrators you know are necessarily ramblers, and I hope you will bear with me.

In order to avoid failures in handling dry plates, I will wish to impress upon you that careful attention to details will carry you over many a bridge that otherwise may give you trouble, and it is these details to which I wish particularly to direct your attention.

Always keep your unopened box sitting on edge rather than laying flat, and if possible in a moderate, even temperature. Use as little light as possible in changing. Be as particular to dust your plate holder as you are your best piece of furniture. A neglect of same will



"SUNSET IN THE POOL" BY J. H. ANDERSON

make much extra work for your spotter.

I find that a cloth or chamois pad is better for dusting plate than the ordinary camel's hair brush. Very often small particles will adhere to the film so firmly that the soft brush fails to remove, while the resistance of the cloth will have the desired effect. Guard against fog by seeing that your holders and camera are absolutely light tight.

Now about your dark room light. Many a perfect plate is spoiled by a defective developing light. I may state here a fact that you doubtless all appreciate, that no light is *absolutely* safe in a prolonged exposure, where sufficient volume is used to properly examine the plate. However, there is a great difference in quality. My instructions for making the safest developing light would be to secure a deep ruby glass, and between this and the eyes

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place as many thickness of yellow post-office paper as volume of light from lamp, gas or electric burner will admit, and I would always use artificial light rather than day light, as day light varies to such an extent at times that you are very liable to misjudge the strength of your negatives. If you can hold an unexposed plate covered half within three or four inches of your light for thirty seconds and develop for five minutes in normal developer without perceptible fog, you may be sure your light is practically safe. Right here let me give you a pointer. After testing and finding your light comparatively safe, don't imagine it will last forever and neglect to ever test again For in time the orange color in the post-office paper will fade, and I find also that the ruby glass sometimes loses its non-actinic value. Doubtless for same reason (that of fading). So keep on the safe side by testing from time to time. It is a good plan to concentrate your light by covering with an opaque curtain or card with opening in center a little smaller than your cabinet plate, removing of course when developing large plates.

In mixing developer results can be spoiled very easily. So don't take an old formula that some one discovered back in the remote ages and expect it to work on any plate you happen to meet, and then blame the plate if results are not up to your ideas. In fact, there are no two plates of different make that can be developed at their best in the same developer. So in order to get at the matter from an intelligent standpoint, let us stop for a moment and consider the essential qualities of a developer.

Were I to ask you just now to name the ingredient which is considered the developing agent proper, you would answer in chorus "Pyro." (I am supposing of course that you all use pyro, as in my opinion all other developers are make-shifts.) Then I will ask what to use to prepare the gelatine film for the action of the developing agent, and you will answer "Carbonate of Soda," or some other comparative alkali. Then I will want to be instructed on how to control color, and you will at once recommend "Sulphite of Soda." Well now, while with scarcely an exception photographers appreciate these facts, it is surprising how few use their knowledge in the development of dry plates.

Let me urge you to drop your stereotyped formulas and go at it from a common sense standpoint. Mix in a good liberal quantity of brains, if you please, and build a developer that will fit the peculiar requirements of the plates you use.

In my opinion more plates are spoiled from an excess of alkali in the various mixtures than from all other sources combined. Very often the photographer realizes that this is his trouble, but possibly his alkali and sulphite, and not uncommonly all three parts are mixed together, and rather than discard developer on hand he will endeavor to counteract the effect by cutting exposure, etc., and of course still fails to secure desire quality. Do I hear some one ask as to indications of over alkali? Does your image seem to appear in good time, and when half or two-thirds developed, begin to lag, and takes a long time to finally build to proper strength, and when it does finally finish, the shadows have a dead effect rather than the clear, crisp quality, so much to be desired? This is positive proof, and the remedy is self-apparent.

A *combined* developer is a lazy man's developer. And the lazy man has no business in the dark-room. Let me advise you to make up the three component parts in separate solutions, make them by hydrometer test, and then you will know "where you are at" as the saying goes. Gauge strength by use of more or less water, so that normal exposures shall develop in from six to eight minutes.

Restrain over exposures by use of bromide of ammonia in normal mixture rather than by using old solution, which at best will discolor your negatives.

Do not load up developer with alkali for under-timed plates or soak in alkali before pouring on developer, as some recommend. You can accomplish more with normal proportions diluted with water than 'tis possible in any other way. The best remedy for an under-exposure that refuses to build up in this way is to break it.

Always use either a rubber bound camel's hair brush or a clean tuft of absorbent cotton in developing tray, and pass over plates occasionally to break air bells and remove sediment.

Don't be stingy with your developer; use enough to cover your plates without necessity of vigorous rocking of tray. In fact, I would not agitate the developer except occasionally in use of brush, believing that plates are richer in quality when developed with slight agitation than otherwise. And you will certainly avoid

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'BEGINNING OF THE DAY'

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many of the small particles of glass so often found in the film, coming from the bumping of the edges of the plates together, chipping off and flying into the film as you rock tray from side to side.

Keep temperature of solutions as even as possible, and avoid extremes.

Filter your fixing bath occasionally, and keep strength where it will fix plates in from eight to ten minutes.

Now, you know, we all have our hobbies. Mine is what I term the bromide treatment for over or irregular exposures and, in fact, most perfect results may be obtained by careful handling on regular normal exposures. In this connection I wish to state that I always prefer bromide of ammonia rather than bromide of potassium, as most formulas recommend. Ammonia restrains without the clogging effect in the high lights that potassium gives.

As an example, we will take four plates and consider three seconds a normal exposure; Expose No. 1, two seconds; No. 2, three seconds; No. 3, four seconds, and No. 4, five seconds.

For the bromide development, add to each eight ounces of normal developer one half dram bromide solution (bromide one ounce, water ten ounces). Place your four plates of uneven time in tray together and pour on bromide developer. I hear some one say, "You will surely spoil your under-time plate." Not so, however, for this same under-time plate will build longer and better and with less liability to fog from having come in contact with the bromide. When high lights begin to appear, you can at once judge as to exposure, and the secret of success with this plan of development is to know just how far to carry plate in the bromide.

In case of the under-exposure, as soon as this condition is apparent, remove, rinse well, and place for a moment in normal developer, then drop into a dish of plain water or very dilute developer and let lay without agitation until shadows are well out, then round up in normal developer to strength required.

In case of full or over-exposure carry in bromide developer to a point where if left longer high-lights will have become too intense. Remove and place without washing in normal developer and finish. Negatives developed in this way are beautifully clear and crisp and very quick printers, as it is not necessary to develop quite as strong as with the ordinary process.

For the benefit of those using Hammer plates, I will give my favorite pyro formula:

No. 1.

Water	32 ounces
Pyro	1 ounce
Oxalic acid	30 grains

No. 2.

Sulphite of soda	60 hydrometer test

No. 3.

Carbonate of soda	30 hydrometer test

Use one ounce of each, Nos. 1, 2 and 3, and six ounces water.

PHOTOGRAPHY NOT LIMITED TO IMITATION. BY A. HORSLEY HINTON.

I was looking up into the moonless sky, between the nodding heads of the trees, grown thick and heavy with their wealth of late summer foliage, and the brief interval between hurrying clouds is only made known by the momentary sparkle of a solitary star. Night cloud and night sky thus are of equivalent values.

I watched the same sky region between those rich green plumes one morning, and the leaves, wet with the shower that had passed, sparkled in the rays which pierced the broken clouds with a brilliance that purest white paper could not approach. Even the deepest green, far more the few ocherous leaves which had hastened so to realize their autumnal gold, were seen as light against the purple rain-cloud behind.

Then came the gray-blue sky, when the cloud had rolled away, and green leaves looked dark by comparison, and the golden ones no longer seemed so bright, and the small beads of glistening rain paled like stars in the heavens at dawn.

A few nights later, when the moon had wooed the night into gentler mood, the night sky had grown lighter, and the hurrying clouds darker and warmer hued, and so there is no fixing any relative degrees of tone for so changeful a thing as clouds. Across a broad common, bounded by low hills, heavy clouds, portentous of rain, are bending down to earth, obscuring the distance, as though pall-like, they would wrap the landscape in their purple folds. Outposts are these of the wild battalions which will

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attend the chariot of the tyrant winter, and against their broad fronts of sable and blue, the stubble field and withered bracken, with the afternoon sun behind us, were gleaming light.

Together they were the lightest areas in the whole scene, save the spot of white of the whitewashed cottage or the yellow sand on the footpath, and we returned from it to remember and to think of the clouds as less aërial, and as a more real and tangible part of Nature than we had supposed.

Was it not in such train of thought that the world's earlier teachers, watching the vast clouds descend and envelope the mountains, falling and mingling with the angry sea, or darkly overhanging upland and broad plain as though it would crush it with its huge volume, saw in imagination the young earth evolved from out a chaotic universe of cloud even as we may to-day find it not difficult to fancy that anon Nature may arouse from its repose, and its page of sweet and simple poetry be changed for one of great dramatic mood, when the divided firmament will re-unite and earth be involved in cloud scarcely less ponderous than its own substance, and the nebulous and formless supplant harmony and order.



AFTERNOON SUNLIGHT BY GEO. W. NORRIS

Clouds and the immeasurable sky, too little seen by eyes turned earthward, quicken the imagination and give food for thought. And from our thoughts and imaginings, we turn to giving expression thereto, and each uses the means most readily under his control One may give expression through music or another by written words, more readily perhaps the painter, being able to give us a resemblance of the visible scene, can thereby conjure up something of the invisible thought.

Anon comes one with a surpassingly perfect means of reflecting the visible, but, learning soon that those things which Nature suggests are often more precious than those she reveals, he strives diligently to so control the production of the image that he imparts to the finished work the suggestion which he received from the original. This is the artist-photographer of to-day. Of all the beauteous pageant which passes before our eyes each day and each season there is no part more full of poetry and none more inadequately expressed by the simple record of prosaic facts than the sky.

In no representation of Nature is the photographer more likely to fail; in none is it more possible to succeed.

In the photographic rendering of clouds, not as atmospheric phenomena, but as vehicles of beautiful thought, we have to-day something of an indication of how much superior the photograph may be when made and controlled by an artist mind.

In the manner that this is done, as exemplified by much of the intelligent photographic work periodically exhibited at the Dudley Gallery, one cannot but feel that a great gap exists between *average* photography and those productions which are so immeasurably greater and finer that mere justice requires one to challenge the too-prevalent idea that a photograph is a mere mechanical copy.

Formerly, the "bold camera-wielder" was blind to all that lies above the sky-line, and a blank white vacuity was his libellous representation for the sky, and to obtain it was his dearest convention. To-day, an accurately-rendered cloud-scape is the everyday achievement of the

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"CURIOSITY" BY L. M. McCORMICK

merest tyro, but photography permits him, who will, to go further.

To those who are using photography, to the less advanced, let me say that in your photographing you possess a far greater power of expression than you have, perhaps, imagined. When you have succeeded in producing a facsimile of the scene, and have dexterously wedded thereto a suitable sky, you have but taken the initial step—you have only, as it were, learned to mix your colors—to use them, to employ your method worthily lies beyond.

The productions of the camera which confront one everywhere—in the street, in the album, in printed books—are not photography in its best sense any more than the village signboard, or many things called pictures, which one may see in the town are ideals of the painter's art.

That phase of photography, to exemplify which the photographic salon is held, is not so much an advance, as a departure, or rather an application of some of the old methods to artistic ends.

But it is still photography, for we lack any other term, and because it is thus claimed in kinship by the average commercial work, the frequency and blatancy of which has secured its survival, and because it owns the same generic name that includes the copying of a picture, the typographical view of place or event, the recording of invisible stars, aye, even registering the shadow of the living skeleton, some writers choose to remain blind and indifferent to the *best* and judge *all* from a superficial glance at the *worst*.

There are those who are diligently and faithfully working to show that photographic methods in artist hands are capable of expressing Nature's impressions and ideas suggested

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by Nature, and not only physical facts and phenomena, at least to a degree which the critic has no right to ignore.

Yet there are many, who from indifference or ignorance, or prejudice, will tell the world that the photographer aims to no higher than direct imitation and that photography and imitation are interchangeable terms. It is vilification and misrepresentation difficult to excuse, and none the less so if it is only intended to apply to the commonplace commercial work, and exceptions are not named.

Truly, the examples of the photographer's art which, with the unprejudiced, might emancipate photography from such a position, are few and rare, but they are frequent enough to be accessible to all who care to see and not to expressly exempt them from the category of things base and trivial, to which most productions of camera and lens belong, were as unjust as to style the producer "the never-enough-to-be-reviled photographer." Whence the ground for claiming such unlimited abuse on the photographer's part?

To slander the man already not too popular is a sure means of securing applause from the inconsequent. But very willingly will we let such pass for the present. Such intolerance of new developments is of the present fashion. Photography's days of high favor are in the future, even its really great achievements are hardly yet, but of its splendid and previously unsuspected possibilities there is ample evidence.

As suggested in an earlier article ("The Toleration of Photography," *The Artist*, June, 1896), it is not photography but photographers who are answerable for past failures and errors, and with whom the making of the future position rests.

At present the artist (I do not mean the recognized practitioner, but the man of art knowledge, artistic ideas and perceptions) has been employing photographic methods for too short a time to do more than indicate whither photography may with good hope aspire.

The process or methods available to the the photographer are many, and are extraordinarily ductile and capable of control. This fact is insufficiently recognized.

The scientist, the craftsman, the technician have for their aim the reducing of photography to an exact science, and work in accordance with previously framed rules and standards.

But the artist availing himself especially of the variability and capriciousness of the result of the process, endeavors by the simplest means to produce not what teachers have told him he should do, nor what the mechanical process would perform almost automatically, but what he previously and deliberately has desired.

And strong desire has guided his endeavor so that latterly the plasticity of photographic process has been cultivated, and a very great degree of emphasis and suppression is now commonly practised by many; and even alteration, and modification of unpleasing drawing which the uncontrolled lens might give, may be accomplished, and might be instanced if further proof were needed of the personal and unmechanical character of the most exalted phase of photography.

At the outset of these remarks cloud pictures were mentioned as one indication of advance, but it is only one.

There are master minds and master workers who have grappled with wonderful success the subtle difficulties of the human figures the undraped figure, the portrait, and even, perhaps, the allegorical, and one might name examples which, to secure recognition as worthy and even noble work, need not be compared with etching, or engraving, or painting, but to which it is impossible to deny a very reputable position, but which, *if* its purpose is direct imitation, either of Nature or aught else, is an utter failure.

We only know of art through the various means of expression which men have chosen. Photography may or may not come to be recognized as one of these means of communicating beautiful ideas, but certainly imitation, copying, or counterfeiting is not the sum and final limit of the photographer's powers.—*The Artist*.

CLOUD AND WAVE STUDIES.

The old days of blank white skies have practically passed away so far as the walls of our exhibitons are concerned, and even the beginner in photography now desires to obtain clouds either on the same negative as his landscape or on a separate plate. It is not difficult to obtain clouds at the same time as the landscape, provided a few precautions are taken.

The simplest way to obtain clouds simultaneously with the landscape is to use isochromatic plates with a yellow screen, the sole purpose

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of the latter being to cut down the strongly actinic blue light from the sky. The particular depth of screen is a matter of judgment, though as a rule the palest tint of commercial screen is quite deep enough for all ordinary clouds, and it is only when the light feathery cirrus—so well known as the mackerel sky—appears that a darker screen need be used.

Even with ordinary plates, clouds may be obtained if a foreground shutter be used—and there are one or two cheap double-drop or window blind shutters on the market which are very effective. The only thing to be careful about is to note that the aperture of the shutter is sufficiently large not to cut off the illumination of the corners of the plate. With one of these shutters it is possible, by carefully manipulating the strings actuating the sliding pieces, to give at least four or five times more exposure to the foreground than to the sky, and without the slightest sign of a line of demarcation, provided the sliding pieces are kept on the move. If such a shutter be used with an iso plate and yellow screen, far better results can be obtained, and the yellow screen may be entirely done away with.

When it is desired to obtain clouds on a separate plate, care should be taken not to point the camera too high, and to include, as far as possible, a small portion of the landscape as well. The lens need not be stopped down very much—about *f*/11 or *f*/16 will be quite enough—and with a rapid plate and a shutter working about $\frac{1}{10}$ of a second, good clouds can be obtained. If a yellow screen is used the exposure may be increased to $\frac{1}{4}$ second, or even more if a very dark screen be used, but this is unnecessary unless the clouds are really required for meteorological and not pictorial purposes. Too short an exposure makes it difficult to obtain correct rendering of the sky, just as too dark a yellow screen will have the same effect. On the other hand, too long an exposure will cause the cloud forms, particularly if at all delicate, to be entirely lost. Almost as important as the exposure is the development of cloud negatives—and care should be taken not to push development too far, so as to obtain too great a contrast, and yet, at the same time, negatives which are too thin will not print well. There is one little point in connection with printing in of clouds, particularly on gelatino-chloride paper, and that is to see that the cloud negative is approximately the same color as the landscape, for, if not, the final tone of the sky will be totally different. This is particularly noticeable when a sky is tinted by sunning down with a card, whilst the landscape may have been printed from a yellow-stained negative.

When we desire to obtain clouds and wave studies combined, it will be found that all the directions given above will be satisfactory. One of the greatest mistakes in the taking of wave studies is to drive the shutter too quick. This means that the wave looks frozen, whilst with a longer exposure there is some fuzziness which gives one a far better idea of moving water. Even for quickly-moving water, less than one-twentieth of a second is rarely required.—*The Photographic News.*



PORTRAIT BY F. H. DAY

Importance of Principles.—"As our art is not a Divine gift, so neither is it a mechanical trade. Its foundations are laid in solid science. And practice, though essential to perfection, can never attain that to which it aims unless it works under the direction of principle."—Sir J. Reynolds.

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If some photographers would only adopt simplicity as the key note to their work the results would be far more artistic. It is a mistake to suppose that a photograph must include everything that is visible to the eye of the operator as he stands beside his camera. Take the most successful photographer of to-day and you will find he has been contented with very little for his picture. Sheard Degas, the artist, once said, "It takes a lifetime of effort to learn how to become simple. We, the old men, have come to it gradually, slowly. We end by it; we did not begin by it." So it is with the photographer. As soon as he becomes the proud possessor of a camera he is crazy to photograph the heavens and earth and all that therein is, and he wants to include them all in each picture, too. By and by he finds that the most artistic effects are obtained with very simple subjects, but he must learn how to handle them, he must learn to subdue or sacrifice altogether everything that is not in keeping with the whole. This is not an easy task; in fact, it is this difficulty that renders ninety per cent. of the photographs produced to-day utterly worthless, save, perhaps, for their topological value, or as personal mementoes.

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Dr. C. G. Burdict writes: "I want to protest against the short time you allow for competition for Times' medals for night pictures. We received the Times about the middle of the month, and we have no way of making the moon shine in the west, if it is not so inclined. Give us a chance and see what we can do in this line."

This is only one of a number of letters we have received upon the subject, so we have decided to extend the time until the end of May.

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In a letter recently received from Prof. McKissick, he says: "I will, in reply to Prof. Searle's communication in your April number, give the results of some experiments that I have made, bearing directly on the points brought up by Prof. Searle.

(1.) Coins and glass in contact with sensitive plate in plate holder and without any "Becquerel ray" compounds near, do not give, after ten days, contact, a permanent image. A stain sometimes appears which is easily washed off.

(2.) With coins and glass on top of an X-ray plate in its envelope (Carbutt's), and the sugar, previously exposed to sunlight, in a paper box, covering the coins, I have been unable to get an image although the plates show that they have been acted on, the whole surface being darkened. I have, however, obtained images of a coin, wrapped in ordinary paper, and then placed on top of a sensitive plate, the salt being scattered on top of the plate holder."

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Dr. Byron V. Tompkins sends us the accompanying photograph of lightning. In a letter referring to it, he says: "It was taken August 16th, 1896, at nine o'clock in the evening. It was taken from a piazza on second story.

Lens used was a C. P. Goerz 7-inch focus, largest stop *f*/7.7. Taken on a Stanley plate, developed with metol.

The plate was fully exposed; have not been able to find the place where the lightning struck, but think it could not have been over one-quarter of a mile distant, probably less than that, as the thunder followed the flash almost immediately. It was one of the heaviest peals of thunder that I ever heard.

It was raining moderately hard at the time when the flash occurred. It was from this cause probably that the water has a mottled or peppery look.

To me the points of special interest are

First, showing clearly the course of the flash.

Second, the amount of detail in the landscape.

Third, the ripples on the water.

Fourth, high lights reflected from water.

Probably the reason for my getting the landscape so perfectly was my good fortune in having the sea and sand on the shore to reflect the light.

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Copyrighted, 1896, By B. V. Tompkins

LIGHTNING FLASH. BY BYRON V. TOMPKINS.

The dark streak at junction of land and sky is from a dark grove of cedar trees and not from shading the landscape in printing, which, of course, I did in order to make the sky dark.

It was taken from the Seaside Hospital of St. John's Guild, Cedar Grove, about one mile from New Dorp station, Staten Island, N. Y."

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WILLIAM GEORGE Oppenheim writes us as follows: I am assured that your sense of justice will induce you to insert the following communication relating to an editorial in your April number.

First.—I have not been "playing a practical joke on the editors of some of our papers and magazines," anent the picture entitled "Sunset on Casco Bay." The assertion is gratuitous.

Second—The "editorial" asserts that "the sun therein is an effect produced by a secondary image of the lens stop."

Is it possible that the editor of the TIMES has a monopoly of the truth?

Many experts of prominence believe differently; are they all mistaken and is the editor alone right in his assertion?

It is believed that these experts are—to say the least—as conversant with photographic cause and effect as is the writer or inspirer of the article in question.

Third.—It is untrue that I "sent a copy to many editors."

I received a communication—in manu propria—from Paul Dana, one of the editors of the *Sun*, a well known amateur, no mean judge of photography, requesting permission to reproduce the "Sunset on Casco Bay" (which he saw in the January number of the *American Amateur Photographer*), in the morning edition of the New York *Sun*.

As a matter of course I accorded the desired permission.

Thereupon Mr. Dana sent reporters to my office to secure a version of how the picture had been produced.

It was two weeks thereafter that it appeared in the *Sun*. Since then I have been requested by several magazines and newspapers, for permission to reproduce it, and was so requested by the New York *Herald*, but declined to give permission, although it was to have appeared in

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the Easter number, April 4th, 1897, on the calendered paper

Fourth.—There is no necessity for me to say anything in defense of Dr. Nicol, his standing in photographic circles is assured, and he has expressed his opinion of the picture in no uncertain terms.

Fifth.—"The picture has been severely criticized"—no doubt of it—it has been praised also. I have in my possession about 400 letters of criticism and of praise, and over 100 requests for copies thereof.

There can be no doubt that any departure from conservative methods will be criticized—it is in the nature of things, and in accord with the unities; many people are so constituted that they must 'kick' if a thing refuses to harmonize with their intellectual yard sticks.

I do not complain of criticism, although I do object to misrepresentation.

Sixth.—I have no knowledge of astronomy or of optics, and never claimed to have.

I sought information from Mr. Ernest Edwards concerning the picture, and he hazarded the observation on the spur of the moment and without pretending to be exact, that so large a sun might require a draw a quarter of a mile long. For aught I know it might or might not require a draw of that length.

I repeated the statement giving my authority, if there is any blame to be visited for this statement, I am responsible for it. Whether there is or not, does not affect the picture.

Seventh.—The statement made in the L. A. W. article "that copies can be obtained at" the Obrig Camera Co. was inserted from pure defense.

My mail was burdened with requests for copies, it was impracticable to furnish them, hence the statement which is found fault with.

Eighth.—As a matter of fact, I have inquiries by the score, for permission to use the "Sunset on Casco Bay," for advertising purposes, from sign painters, chewing gum manufacturers, stationers, *et id omnes*—and have refused all offers, although many were accompanied by promises of cash.

Three New York newspapers have asked for permission to print the "Sunset"; two editors of magazines have personally called on me for permission to reproduce the "Sunset."

I have never claimed credit for making the picture; the scene was there. So was I—that is all.

In a recent issue of *The British Journal of Photography*, a description is given of a process, invented by Mr. Eugène Gay, by means of which reproduction of drawings in black upon white can be made. The process is said to be especially valuable for architects, masons, etc., where copies of tracings are desired:

"This process consists in treating glazed drawing-paper with a mixture composed as follows:

Gum arabic	100 grammes
Bichromate of potash	40 grammes
Water	300 centiliters.

"A certain quantity of carbonate of soda—½ a gramme, for example—is preferably added to the water.

"This mixture is spread by means of a plush brush, upon the paper, which is then dried in the usual way.

"The paper thus rendered sensitive is ready for the reproduction of a drawing on tracing paper.

"As this paper is much more sensitive than ferro-prussiate paper, there is no need for a longer exposure to the light than five to fifteen minutes, according to the clearness of the day and the quality of the tracing paper, the opacity of which varies greatly.

"The paper, after exposure, shows a dark yellow drawing upon a brownish ground. The paper is then submitted to a first washing, which must be very delicately carried out; then to a second, with the aid of a sponge, until the lines of the drawing appear hollow, owing to the dissolving action of the water.

"The paper is then taken out of the bath, dried first with blotting-paper, and then exposed to the air.

"The paper is afterwards coated by means of a sponge with the following composition:

Gum lac	75 grammes
Lamp-black	70 grammes
Spirits of wine of commerce	750 centiliters

"It is then plunged into a bath of hydrochloric acid, in which it is allowed to remain for about twenty minutes.

"The paper whitens under the action of this acid, and the drawing comes out in black.

"It is then cleaned by brushing and washing in pure water, then dried, and the operation is complete.

"The claim is for a process which consists in sensitizing the paper by means of a coating of gum arabic, bichromate of potash, and water; then drying, and, after exposure, washing; then drying and coating with a composition of gum

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lac, lamp-black, and spirits of wine, plunging into a bath of hydrochloric acid, and then washing and drying."

* * * * *

Mr. R. D. O. Smith writes: "It think it probable the objections to the Nude in Photography will always remain and are more likely to become more pronounced than to be softened, and I think so for these reasons: The nude in sculpture or in painting never possesses the personality which must always attach to a photograph. The nude in art is accepted only as an ideality, and as representing the ideal figure, not as portraiture. This is not possible in photography. The ideal figure does not exist entire in any model, and the photograph does not lend itself to composition like painting or sculpture. The photograph is and must remain a portrait of the model and the model must always fall below the ideal. The difference is the difference between nudity and nakedness. The statue is an ideality and is nude. The photo is and must remain a picture of nakedness. It is simply a portrait of somebody unclothed, and it must, therefore, be as uninteresting as the same figure clothed would be, except to the prurient fancy which cares only for the nakedness.

"Besides all that, the camera has its own tricks, and they are too often ignored, witness the left arm of the figure on page 213. Possibly the Nude in Photography may have its uses but I do not believe they are in the direction of public exhibition like the Nude in Art."

* * * * *

The Same Correspondent writes: "Mr. John D. Elliott says, 'no photographs of any landscape should be taken with a lens of less than 10 inch focus,' and that when a lantern slide, made from a 4 x 5 plate is exhibited, a fake is perpetrated upon 'an unsuspecting audience,' and which, I think, is only partly right. Some two or three years ago I made some experiments on the effects of focal lengths (detailed heretofore in the pages of the Photographic Times) and I satisfied myself, at least, that a lens of 18 inches focal length would give perspective almost exactly as the eye sees it. More careful comparisons would, perhaps, modify this, but 10 inches is certainly too short, and the slide from a negative made with a 10 inch focus would be a fake too. The short, focus exaggerates distance, but in landscapes that distortion is not generally a painfully noticeable one.

* * * * *

We all go potting away trying different dodges for pleasing effects to please our aunts and our sisters, and to amuse children. How many are there who, quite heedless whether the effect will be pleasing to others or not, set themselves a task, a conception, which they are determined to carry out? Were this done by one in a thousand of those who own cameras a totally new view would be taken of photography and its capacities.—J. S. Bergheim.

* * * * *

"Difficult as it necessarily is to get figures that will assimilate with the landscape, they should never be neglected. Landscape without a figure is a suggestion unfulfilled; a fitness unused; an opportunity wasted. The figures should be not only in the picture but of it. If more than one is introduced they should appear to so belong to each other that to separate them would ruin the whole."—H. P. Robinson.

* * * * *

A very curious effect can be obtained by reversing the film in the chronophotographic apparatus. This was demonstrated a short while ago before the Academy of Sciences in Paris, and even this slow body of savants had to give vent to a few smiles at the result. For instance, one series of pictures represented in the proper oder a man at his ease pulling out a cigar from his pocket, puffing clouds of smoke in the air, and, after finishing his smoke, throwing away the butt. Imagine, however, the reverse action. The man is seated in his chair, the butt of the cigar flies up from the floor into his hand and then into his mouth, the clouds of smoke imperceptibly accumulate from all parts of the room into his mouth, and as he smokes in this peculiar fashion, going through the most extraordinary movements, the cigar grows larger and larger until it attains its full size when the man places it back into his pocket.

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MY METHODS OF MAKING LANTERN SLIDES.*

BY T. MORLEY BROOK.

A month ago I was requested to demonstrate before you my method of producing lantern slides, so, when I got home, I got out my note book and fountain pen, thinking that I could make a really good paper out of the subject; but, whilst I was wondering where to begin, I remembered that there were three others to follow me, and far better slide-makers than I could pretend to be; and then again I bethought me that possibly they might come before me; and so all the wind would be taken out of my sails, and my grand paper might sound like an old, old story. And, again, as most successful slide-makers work on much the same lines, it would perhaps be better not to write anything very elaborate, so I just jotted down a few stray thoughts, and will leave the demonstration to speak for itself.

The first thought that came was a remark I once heard or read that "in the making and exhibition of lantern slides is more promise of practical use and pleasure to the greatest number than in any other photographic process whatever," a remark with which I entirely agree, for an ordinary print or transparency may give pleasure to a select few, but a good lantern slide may give pleasure to hundreds, or even thousands, at one and the same time.

I have heard it said that there are *no* pictorial possibilities in lantern slides—that when projecting on the screen they are altogether too ephemerical to be classed with prints on paper. Of course, they cannot, that I acknowledge, but they form a class of their own, and I confess that many slides that I have seen live in my memory, and always will live, and are a constant source of pleasure to me, such as no print I have ever seen is.

The quality of the slide depends in a very great measure on the excellence or otherwise of the negative, both technically and artistically, from which it is made. It is difficult, if not impossible, to make a good slide from a poor negative. What is the best kind of negative for this purpose?

I should say, from my own experience, one that will give a good print in cold-bath platinotype will give equally good lantern slides—that is to say, one that is correctly exposed and developed so as not to give excess of density in any one spot, and is at the same time fairly sharp and full of half-tones and detail.

At the present time, owing, no doubt, to the extensive use of gelatino-chloride papers, there is a tendency to produce rather thin, weak negatives; though that kind of negative is not the best for lantern-slide work, a great deal may be done by altering the exposure and developer. For this, fully exposed negatives, cutting down the exposure somewhat and using a strongish developer, will help to produce a crisp result; or from a somewhat hard negative a better result will be obtained if a full exposure nearer to the light is given to the plate and a little weaker developer is used.

I cannot tell you of anything new in slide-making; in fact, I don't think there is anything new to be told. My method is, I believe, almost identical with that of many of our friends; but, as I have never had the pleasure of seeing any one else make a lantern slide, perhaps my method may be different in some minor points.

I may say that, although I have been fairly successful, I am not a very prolific producer of lantern slides, for the reason that almost all my slides are produced by reduction in the camera by daylight, and I have very little spare time whilst that light is available; but I can say that I firmly believe that by reduction we get better results than by contact printing, for this reason: in all negatives there is always a certain amount of granularity, more especially in negatives produced on very rapid plates; so, of course, this granularity must of necessity be transferred to the lantern plate when printed by contact, whereas, by reducing the size of the picture, you also reduce the size of the grain in the negative.

I have brought my very primative home-made apparatus with me to show you that you need not spend much money in that direction. It consists, as you see, of a wooden box, with the ends taken out, fixed on one end of a board, and at the other end is an old quarter-plate camera. It is attached to the board by an ordinary mill-headed screw, which moves backwards or forwards in a slit cut for the purpose in the board; so you see that, if you have time while there is daylight to make your slides the expense need not be great—lantern plates are cheap, the apparatus is cheap, and the chemicals amount to a mere trifle.

I occasionally work slides by contact, as it sometimes happens that a small portion of a negative is better than the whole, and for this process I find a special printing frame is advisable. The one I use is made by Middlemiss, and cost three shillings. It is well worth the money, as by its use I can most accurately render the part I wish to reproduce and have no fear of the light creeping in round the edges of the plate and so causing fog, as it will do when an ordinary printing frame is used; and another advantage I find, is that there is no danger of scratching, and so utterly ruining, what may be a very valuable negative.

Having selected the negative I wish to print from, I next consider whether the slide is to be made by contact or reduction. If I wish to include all that is on the negative, there is no alternative, it must be made by reduction, whether the negative be a quarter-plate or a 12 x 10 one; but, if only a small portion of the subject is wanted, then I may decide on making it by contact. Supposing that I decide on the latter, I carefully spot out any pinholes there may be with Indian ink, and, when that is dry, as carefully dust with a flat camel's hair brush, and then adjust it in the frame, and, after dusting the lantern plate also, just drop it in position, turn up the gas, and expose at a distance of twelve inches from the light, for from thirty seconds to three or four minutes, according to the density or color of the negative. I then proceed to develop, having previously made up the following solutions:

1

Hydroquinone	160 grains
Sulphite soda	4 ounces
Citric acid	80 grains
Bromide potash	40 grains
Water	20 ounces

2

Hydrate soda	160 grains
Water	20 ounces

3

Ammonium carbonate	1 ounce
Water	10 ounces

4

Potassium bromide	1 ounce
Water	10 ounces

* Read before the Manchester Amateur Photographic Society.

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If I wish the slide to be brown, I now take

No. 1	½ ounce
No. 2	½ ounce
No. 3	30 minims
No. 4	30 minims
Water	8 ounces

But, to produce black tones, I only take

No. 1	½ ounce
No. 2	½ ounce
Water	2 ounces

I now see that my dishes, etc., are properly clean, and then take out the lantern plate and again carefully dust it, place it in the developing dish, and pour over it the solution, seeing that every portion of the plate is covered by it as quickly as possible, and rock the dish gently

And now that most difficult problem faces me, when to stop development; and I am sorry to say that all I know about that is that I stop when I *think* the density is about right. No infallible rule can be laid down But I would advise all who are without experience to beg, borrow, buy, or st—— them! At least, by some means, get a really good technical slide and keep it for comparison. I generally develop until it appears to be a trifle more dense by transmitted light than the finished slide ought to be; in fact, I develop until the high lights just begin to show signs of veiling over, as it loses somewhat in the fixing bath. If the high lights veil over before density be obtained, it is a sure sign of overexposure. When the critical time has arrived, I give it a good rinse in water before placing in the usual hypo bath, as, if this be not done, stains are very liable to result. The slides remain in the fixing bath (4 or 6 ounces hypo to 20 ounces water) for at least ten to fifteen minutes, and then wash in a siphon tank in constantly running water for about an hour, and finish off with a good swill under the tap. At the risk of appearing wearisome, I would emphatically repeat, that to be sure of getting permanent results the fixing and washing must be thoroughly well done.

VARNISHES.

Matt Varnish.

Sandarac	1 ounce
Ether	10 ounces
Toluol	3½ to 4 ounces

Tinted Matt Varnish (for Masking).

Stock Color Solution.

	Malachite green	10 grains
	Alcohol	1 ounce
1	Matt varnish	5 ounces
1	Color solution	30 minims
2	Matt varnish	5 ounces
2	Color solution	60 minims

Do not mix more than will be used in about a month.

Black Varnish.

Benzole	10 ounces
Turpentine	1 ounce
Masticated rubber heated to fusing	100 grains

Dissolve the rubber in the benzole and turpentine, add 4 ounces of asphaltum broken small.

Amber Varnish (Abney).

Fused amber (powdered)	1 ounce
Chloroform	16 ounces

Gives very hard and bright film.

Shellac Varnish.

Orange shellac	1½ ounces
Methylated spirit	20 ounces

Mix the shellac with an equal amount of crushed glass, pumice, or cinders, and add the spirit. Shake until dissolved. Clarify by exposure to sunlight, and then filter.

Bleached Lac Varnish.

Bleached lac	1½ ounces
Methylated spirit	20 ounces

The lac must have been quite recently bleached. Prepare as in the above formula.

Flexible Collodion Varnish.

Pyroxylene	100 grains
Ether (methylated)	5 ounces
Alcohol	5 ounces
Castor oil	16 minims

Gutta-Percha and Paraffin Wax Varnish.

Very suitable for waterproofing dishes. Take equal parts of wax and gutta, melt the gutta in a saucepan, add the wax and mix thoroughly. Apply hot.

Elastic Caoutchouc Varnish.

Heat two parts of common resin in a saucepan until it gives off a vapor, add one part of caoutchouc, and stir until thoroughly mixed; then remove pan from stove and add two parts linseed oil, heat well, and stir till quite cold.

Watertight Varnish.

Brown resin	8 ounces
Beeswax	2 ounces

Melt together in a tin pan, and when quite fluid coat the dish, which should be quite dry and warm.

Crystal Varnish.

Gum dammar	250 grains
Benzole	10 ounces

Apply cold.

Varnish for Wood.

Useful for Inside of Wet Plate Slides, etc.

Sandarac	4 ounces
Methylated spirit	12 ounces

Dissolve and add 200 grains Venice turpentine.

Varnish for Restoring German Gilt Mouldings.

Gamboge	30 grains
Dragon's blood	240 grains

Powder, and add turmeric, 30 grains; shellac, 2½ ounces; sandarac, 2½ ounces.

Place the whole in a bottle, and add 2 ounces dry oil of turpentine. Shake often, and keep in a warm place for 14 days. Filter and add 4 ounces of clear mastic varnish as below.

Mastic Varnish.

Mastic	14 ounces
Canada balsam	3 ounces
Sandarac	6 ounces
Turpentine	44 ounces

Shake and stand until quite clear. Filter. The ingredients *must be quite dry*.

Retouching Medium (Piquepe).

Gum dammar	240 grains
Turpentine	10 ounces

—*From Photogram Calendar.*

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NOTES.

The Y.M.C.A. of Deposit, N. Y. have organized a camera club.

The Camera Club of the Fostoria Bicycle Club has been formed at Fostoria, O.

The Photographic Association of Ohio is sparing no efforts to have a successful convention this year.

The resistance of Jena glass to sudden changes of temperature is remarkable. It may be heated to 300 deg. or 400 deg. Fahr., and then plunged into cold water without cracking.

The Word "Vitascope," which is one of the recent additions to the English language, is the subject of a suit in the United States Circuit Court, because the persons who claimed to have coined it deny the right of others to apply the term to articles they manufacture.

300,000 Francs have been offered in prizes by the Belgian government for the best solutions of certain astronomical problems, one being to find a means by which planetary details may be photographed as clearly as they can be observed.

The Wellington Camera Club, Wellington, New Zealand, sends us a copy of the catalogue of exhibits at their second annual exhibition. The book is illustrated with reproductions of the best work exhibited, and includes some very charming pictures.

Tinting Bromide Prints, an ingenious process for printing bromides has been suggested by Mr. W. H. White. Powdered crayon is applied to the print with a camel-hair brush, and the print is afterwards steamed. This causes the gelatine to become tacky and the crayon is incorporated with it.

The Way to Photograph Baby.—Procure six 6 inch wire nails, 6 oz. chloroform, 1 handkerchief. Saturate the handkerchief with the chloroform and press over the nose and mouth of the baby till perfectly quiet. Then drive nails through each ear, hands and feet into a board large enough for background. Use hammer to the parents if necessary.—T. Lee Syms in *Photographic Life*.

Mr. B. W. Kilburn, the famous stereoscopic photographer, has laid aside his camera for a season, and is now representing his legislative district in New Hampshire very acceptably and ably in the House of Representatives of that state, at Concord. Mr. Kilburn has not abandoned photography, however, and at the conclusion of his legislative duties intends once more to take up his camera.

The Lowell Observatory to go South from Arizona.—The Lowell Astronomical Observatory, which was established at Flagstaff, Arizona, in 1894, for the study of the planets, especially Mars, is in process of removal to the City of Mexico. The lenses of the great telescope have already been removed. The object in going south is to secure good views during the winter months, and the experts who have studied the question, say that this desideratum can be obtained on the Mexican plateau, which lies within the tropics and has an elevation of about 8,000 feet above sea level.

La Plaque Photographique, par R. Colson. Paris: Georges Carré et C. Naud, 3 Rue Racine.

After a brief summary of the manufacture of the gelatino-bromide dry plate the author deals in a most thorough manner with the action upon it of the chemical light and heat waves, mechanical and electrical action, etc In discussing the formation of the latent image the author takes a new substance into consideration—the organic matter contained in the gelatine. Of course there is a chapter devoted to the X-rays.

The Roentgen Rays have recently been employed in an entirely new field. Herr Friedrich Burger of Munich, who owns a head of Christ ascribed to Albrecht Dürer, has proved its genuineness by means of the rays, which revealed the fact that the head was painted on a silk handkerchief stretched on the wood on which it was supposed to have been painted. It disclosed, also, a Latin inscription, the monogram of a grandduke, Dürer's own initials and the date 1524.

Iron and Silver Stains on Linen.—Iron stains can be easily removed by hydrochloric, or else a hot solution of oxalic acid, washing the article well afterwards. Silver stains should be removed before the linen is ironed; wet the stain, and put on a few drops of solution of potassium cyanide; if it does not disappear, wash, and put on a drop of solution of iodine in potassium iodide; the cyanide will then dissolve it. This latter will also remove stains from the hands.—*The Photographic News*.

Stripping Films.—The simplest way of stripping films, which, when removed, does not expand nor lose its intensity, is to soak the negative in clean water, and then transfer in the following:—

Ammonia .880	½ ounce.
Water	10 ounces.

Let it remain in this bath for 15 minutes, and then it will gradually leave the glass. Take the film and give it a good washing. Then get another *clean* glass and

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immerse in clean water. Lay the washed film on it and draw both from water, omitting air-bells, and then set up to dry.—A. F., in *The Photographic News*.

California Camera Club.—The annual meeting of this society and election of officers was held last evening at the clubrooms in the Academy of Sciences building. The reports of the various officers and committees showed the organization to be in good condition financially and numerically, there being a surplus of money on hand, and the membership being 342.

The election resulted in the choosing of the following officers to serve during the ensuing year: W. B. Webster, president; W. E. Goodrum, first vice-president; E. W. Jensen, second vice-president; H. B. Hosmer, secretary; E. G. Elisen, treasurer; A. L. Coombs, corresponding secretary; J. J. B Argenti, librarian; C. P. Cormack, E. J. Dollard C A. Lee, Phil Maunder, directors.

Photographing the Vibrations of Chords.—A. Cornu, by fixing small mirrors to various parts of vibrating chords and recording the movements of a reflected pencil of light upon a sensitive plate, has studied the nature of the vibrations, produced by pulling, beating or stroking a chord. As the phenomena are rather complicated, the investigation cannot be said to be complete as yet, but it has already brought to light one remarkable result, which up till now has escaped observation. He finds that transverse vibrations, however generated, are always accompanied by torsion vibrations, which latter are most pronounced when the chord has been stroked, less when it has been pulled and smallest when it has been struck, in which case these torsion vibrations subside very rapidly.—*Naturw Rundschau*.

Photographers' Association of America.—Mr. Geo. W. Varney, secretary of the association, writes:—Will you again please make the customary call to photographers for membership's fees and dues for the coming red letter convention, quoting article second, section four: "The annual dues become payable in January of each year, any member failing to pay the same prior to the adjournment of the annual meeting shall forfeit his right for membership, and can only be reinstated on payment of new initiation fee as in case of new members."

It is hardly necessary to state that prompt response will save delay at the Convention Hall, and greatly assist the Treasurer in his duties during the coming year. Heavy exchanges now being charged on all checks, remittance must be made by money order, postal note, express order, registered letter, or draft on Chicago.

Albany Camera Club.—The annual meeting of the Albany Camera Club was held at the Club House, No. 72 Chapel Street, Albany, N. Y., on Friday, April 2d, and resulted in the election of the following officers for the ensuing year: *President*—W. W. Byington; *Vice-President*—Dr. L. H. Neuman; *Treasurer*—E. D. Mix; *Secretary*—C. B. Tillinghast; *Librarian*—Dr. C. E. Davis.

Reports of officers showed the Club to be in a very flourishing condition. The membership is large and much activity has been shown during the winter in the preparation of prints and slides for the Annual Print Exhibition of the Club. The exhibition took place during the week ending April 13th, and was a great success.

Many beautiful portraits and landscapes were shown, while the interiors and enlargements showed most careful and painstaking work.

The prizes were given for portraiture to E. D. Mix and W. W. Byington. For Interiors to Col. Augustus Pruyn, and for landscapes to C. W. Reynolds.

For instantaneous work the first prize, a silver medal, was given to L. H. Stewart.

Among the exhibits were some 60 of Mr. Timmins' prize specimen prints, which attracted so much attention wherever shown.

Lantern Slides in Prussian blue.—Coat a number of clean glasses with a 5 per cent. solution of any good gelatine, allow the gelatine to set, the glasses being leveled, and set up to dry in a room free from dust. The sensitizing solution is made as for the cyanotype process:

Citrate of iron and ammonia	1 part in 8 water.
Ferrocyanide of potassium	1 " 8 "

Mixed in equal proportions, filter, and soak the gelatined plate for about five minutes, and allow to dry. Expose under negative, time required about double that of albumenized paper. The image is fixed by washing until all yellowness has disappeared, it can be cleared by slightly acidulating the water with hydrochloric acid. The mixed solution will not keep very long.—Rae, in *The Photographic News*.

Glass-ware.—In photographing glass-ware of almost any kind it is far better to have the light shine through the object than on it. To accomplish this a box of suitable size with the bottom knocked out and replaced by a screen of ground glass, tissue paper, or tracing paper and a small shelf fitted across this screen upon which to place the object. This box arrangement should now be placed close to a well-lighted window, on a tall table or stand, and if the room has more than one window, those not required should have the blinds drawn to exclude the light, allowing only that which passes through the object to enter the lens the camera, of course, facing the light. By this method the negative will be clear, soft and without any harsh high lights or reflections—of course, much depends on the exposure, which will be short and can be accurately gauged by a little practice.—*Photogram*.

Blood-Red Prints.—In the *Revue Suisse* a method for obtaining red prints with uranium and iron, is described by E. Liesegang. The salts of uranium, like those of iron, are sensitive to light. If a paper coated with nitrate or chloride of uranium is treated, after exposure to light, with potassium ferrocyanide, the image obtained is red and not blue, like that given by ferrocyanide. The ferrocyanide only attacks the oxidized portions, *i.e.*, the parts that have been attacked by the light. The red color produced resembles the ordinary tint of platinum prints toned red. To obtain this result the prints ought to be immersed in the following bath:—

Nitrate of uranium	10 grains.
Potassium ferrocyanide	2 grains
Acetic acid	1 dram
Water	2 ounces

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In the case of platinum prints the platinum is attached by the ferricyanide and forms a double ferrocyanide of platinum and potassium. The ferrocyanide formed by the re-action in the proof acts upon uranium salt, producing a ferrocyanide of uranium The black metallic platinum disappears to leave in its place a red color. By the same means silver prints can be transformed into ferrocyanide of uranium prints. The red color can be allowed a certain exposure to actinic light, so that the process can be applied to the intensification of negatives.—*The Photogram.*

"When Dean Meets Dean!"—In the delightful series of 'Varsity Tales now appearing in the *Windsor Magazine*, Max Pembleton tells the following story of "Red Morgan," the famous Dean of Jesus College:—

"It befell that he found himself in the quad of Christchurch at Oxford, and, being an expert photographer, what should he do but produce his camera and pose it for a picture of a court so famous. Scarce was the tripod set, however, when a porter came running from the lodge and began to expostulate.

"'Sir,' said he, 'I beg your pardon, but you are not allowed to take photographs here!'

"'Man,' cried the Dean, in a voice of thunder, 'do you know who I am?'

"The porter's knees shook. For a moment he imagined that he had become one of the walls of Jericho, and that a blast from heaven smote him.

"'N-n-n-no, sir,' he stammered.

"'Then know that I am the Dean of Jesus College, Cambridge, and that I *shall* take photographs here!'

"The porter ran for his life. 'Red Morgan,' glaring round the court like a bull which has tossed a banderillo, resumed his occupation. He was just inserting a plate in his camera when another little man, gowned, and dancing with anger, dashed across the court and faced him.

"'Sir,' squeaked the little man, with the voice of a hysterical piccolo, 'you must not take photographs in this college!'

"'Red Morgan' turned his head.

"'Man,' he yelled, 'do you know who I am? Then learn. I am the Dean of Jesus College, Cambridge, and I say that I *shall* take pictures here!'

"'Sir,' retorted the little man, while he gave the camera a kick and sent it flying, 'I am the Dean of Christchurch, Oxford, and I say that you *shall not* take pictures here!'"

Blue Prints on Linen.—Tranchaut, in his little work, *La Linotypie*, which deals with the making of prints on material, and not with the linotype machines, gives the following method of sensitizing linen for blue printing. The well-washed linen should be first immersed in a one per cent. solution of hard gelatine, and dried, and then sensitized with one of the following mixtures:

A

Ammonio-citrate of iron	25 parts
Water	100 parts

B

Ferridcyanide of potassium	25 parts
Water	100 parts

Add A to B, and filter, and keep in the dark. Or the following may be used:

A

Citric or tartaric acid	26 parts
Water	200 parts

B

Ferric chloride	20 parts
Water	100 parts

C

Ferridcyanide of potassium	22 parts
Water	100 parts

D

Ammonia	about 40 parts

Add A to B, and then D, gradually shaking between each addition, and, finally, add C in the same way, and then filter the mixture. The linen can be sensitized by brushing the solution on with a water-color brush. The latter mixture gives a more sensitive preparation than the former.

Strengthening Lantern Slides.—A writer in the *British Journal of Photography* gives the following hints on modifying the tone and strengthening the contrasts of lantern slides

If the exposures have been properly timed, the slides, when laid face down on white paper, will be quite white in the high lights; if, however, the white paper is degraded in those parts, the best effects cannot be expected, and such results will not fairly represent the suitability of the process for this class of work. Supposing that negatives having good contrasts have been used, no further treatment will be required, unless it be desired to modify the tone. This may be done by simply dyeing them in a solution of alizarine in dilute ammonia, followed by a dilute alum solution, or with sulphite of indigo for cool tones.

The best method known to me for giving great vigor and fine color was published by me, ten or more years ago, in one of the photographic almanacs.

Prepare three solutions:—

A.

Distilled water	1 pint.
Silver nitrate	5 grains.
Dilute ammonia just sufficient to give a clear solution.	

Avoid a large excess.

B.

Distilled water	1 pint.
Citric acid	5 grains.
Pyrogallic acid	1 grain.

C.

Distilled water	1 pint.
Silver nitrate	10 grains.

Proceed as follows:—Place the dry transparency to be treated in solution A for half a minute, and wash. Take sufficient of B in a glass measure, and add to it half a dozen drops of C, and at once flow over the slide; the effect is very rapid, and if washed off at once the color will be warm, but if the action is allowed to go on the color will become cooler. If the negatives used have a fair amount of contrast, this treatment will give the slides great richness when thrown upon the screen.

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TRADE NOTES.

Moran's Bargain List, No. 47, is just out. Every reader should send for a copy.

The Long Island Mutoscope Company filed articles of incorporation last month. The company is stocked for $500,000 and commenced business with $2,000. The objects of the company are the manufacture and sale of photographic and mutographic implements and appliances. The names and residences of the incorporators are: David W. Pye, Brooklyn; Lysander W. Lawrence, Brooklyn, and Edward Shroeder, Jersey City. Principal Office, Jersey City.

Mr. J. C. Millen the well-known manufacturer of blue print paper, advises us that he has removed his main office and factory to Denver, Colorado, and will conduct the business under the firm name of J. C. Millen, M.D. From that office all accounts will be rendered and all bills paid, and to it all remittances should be made.

The Philadelphia office will still be maintained and it will be a distributing center for Eastern trade. This office will be under the personal management of one who is thoroughly familiar with the details of their business and all orders will receive prompt and careful attention.

The change in the firm name and the removal of the main office to Denver does not indicate any change either in the personality of the firm or in the products of the factories, the business remaining under the same management as since its establishment by Dr Millen in 1885 as the Philadelphia Blue Print Co.

The Cooke Lens.—From Messrs. Taylor, Taylor & Hobson of Leicester, England, we have received one of these new lenses, and with it a neat booklet entitled "A New Era." In this little work the two defects common to the old types of lenses, i.e., astigmation and curvature of image are explained. Every photographer knows that to obtain a picture sharp all over the image must be thrown on a surface shaped like the interior of a bowl. Our photographic plates are not so shaped, however, and the only way in which we can increase the sharpness of the image is by using a small stop with the natural result that the exposure is materially lengthened.

The Cooke lens, the latest production of this firm, possesses to a remarkable degree the property of overcoming these defects with astonishing results as shown in the book by comparing the image obtained with it with a lens of the rapid rectilinear type.

To summarize the qualities of these lenses we may say that they consist of a negative element enclosed between two positive single elements.

They are fitted to do in a superior manner the work for which the rapid rectilinear or symmetrical type of lens has until recently been used.

They are themselves rectilinear, free from spherical error and chromatic aberration both of axial and oblique pencils. But the errors of astigmatism and curvature of field, which in the rapid rectilinear type are considerable, are eliminated in the Cooke lenses at all angles up to 25 or 30 degrees from the lens axis.

Owing to the forms and relation of their surfaces these lenses are remarkably free from flare or ghost or other result of surface reflection.

For producing negatives for multiple color-printing, in which the exact coincidences of different color images is of great importance, we think that these lenses will meet a long felt want, as by slightly adjusting the separation of the back-lens, the relative sizes of the color images may be altered without affecting the other correction of the lens.

NOTES ABOUT PHOTOGRAPHERS.

Edgar Pickard, of the Thornton Pickard Co. died recently.

Messrs. Hollinger and Rockey have attracted much attention by their artistic work. Their studio at 518 Fifth Avenue is well worth a visit.

W. D. Murphy was elected president of The Camera Club (New York). A better choice could not easily have been made.

Jos. M. Brooks, of Columbus, Ind., sends us a photograph of the A.R.R. It is good technically, but the subject is not one that lends itself to artistic treatment.

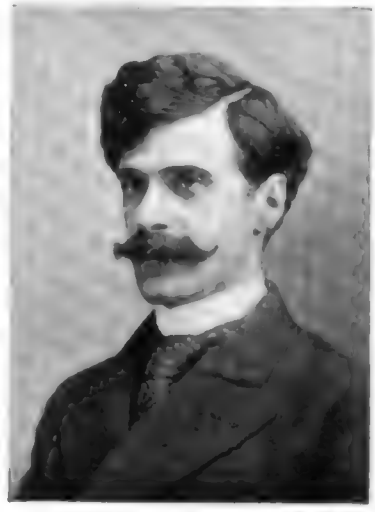


Photo by Davis & Sandford.

ALFRED STEIGLITZ.

Alfred Stieglitz was elected Vice-President of The Camera Club (New York). Mr. Stieglitz more than deserves this honor.

M. Lippmann has been awarded the Progress Medal of the Royal Photographic Society, which will be presented to him in June next, on which occasion he will read a paper before the society.

W. K. L. Dickson, of the Mutoscope Co., has sailed for England to make photographs of the Jubilee Celebrations. These animated pictures will be exhibited in the biograph, one of the best, if not the best, of the projecting instruments.

Prof. Edweard Muybridge, formerly of Pennsylvania University, gave us the pleasure of a personal call the other day. Prof. Muybridge is about to start for the other side on his annual lecturing tour on "Animal Locomotion" amongst the English colleges and schools. He does very little photographing at present, confining his efforts mainly to lecturing and writing. Although in his seventy-second year he looks and feels, as he himself says, "as young as he did twenty years ago," taking a ten mile walk every Sunday, and enjoying it as much as he ever did.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF APRIL, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

579,949. Roll Holding Camera. Frank A. Brownell, Rochester, N. Y., assignor to Eastman Kodak Company, same place.

A camera is provided with a removable frame having a film chamber, a pivoted film spool carrier adapted to carry a film spool at one end and pivoted to the frame at the other being adapted to be swung out of the chamber when the frame is removed from the casing. A spool is connected to the free end of the carrier.

580,024. Stereoscope. Richard R. Whiting, Indianapolis, Ind.

A box opened at one end is provided with a cover also opened at one end and hinged to said open end of the former, a stereoscope hood being hinged to the outer end of said cover. A division board is also hinged to said cover. A combined end board and support is hinged to the end of the box and is adapted to close the opened end of the box and cover the same when folded or closed, a brace being provided for holding said board in proper position.

580,077. Photographic Plate Holder. Macfarlane Anderson, Northport, Wash

A metallic ring is provided with light obstructing devices stretched thereacross from side to side and attached thereto at their ends. A facing ring of thin metal is placed on said ring, the thin edge thereof projecting radially beyond the first-named ring, whereby the device may be supported. A screen is supported by this device and adapted to revolve throughout substantially ninety degrees to either side of a center.

580,155. Photographic Vignetter. Benjamin B. Donahoe, Grand Rapids, Mich., assignor to J. D. Gallagher and J. W. Marks, same place.

The inventor provides a tube capable of being turned upon its axis, a rod being extended therethrough and rotative therein. Means are provided for detachably fixing the rod to the tube so that they may be turned together or separately when desired. Brackets are secured upon the end of the tube and a rack is longitudinally movable within said brackets relative to the end of the tube and carried with the latter when the same is mounted on the end of said rod and engages said rack for raising and lowering the same, an arm being pivoted to said rack and provided with a rod for turning the same upon its pivot.

580,178. Stereopticon. Adolph Merkt, Brooklyn, N. Y.

A light-casing for stereopticons is provided with slots or openings in the sides of its upper part, inwardly curved, downwardly extended flanges being arranged in front of said openings. A guard plate is located below the top-plate and provided with a curved guard flange arranged adjacent to and transversely of the lens tube for directing the products of combustion away from the lens.

580,595. Photographic Shutter. Frank A. Brownell, Rochester, N. Y., assignor to Eastman Kodak Company, same place.

A photographic shutter is provided with a suitable motor and a catch for retaining the shutter against the action of said motor. A movable member independent of the catch is connected to the motor for placing it under tension when moved in one direction and adapted to co-operate with the catch to release it when moved in another direction.

580,748. Vitascope. Thomas Armat, Washington, D. C.

A suitable film strip is provided with a tension device, a rotating element being arranged to cause the film to intermittently move through said tension device. A drum for taking up the film as it is intermittently moved, is provided, the same having a gear connection with said rotating element. This gear connection is so proportioned and timed that the interval of exposure of the film shall predominate the interval of motion.

580,792. Toy Camera. Andrew P. Miller, Tonawanda, N. Y.

A front board is pivotally arranged within a suitable casing and provided with a lateral slot. An elastic band is secured at one end in said slot, the other end thereof passing outwardly between the edge of the board and the casing, and attached exteriorly to the casing under tension. Suitable means are provided for holding the board normally against the action of the band and to release it and allow it to rotate.

581,004. Process of Producing Photographic Pictures on Porcelain. Joseph F. Fritsch, Brooklyn, N. Y.

The process of producing photographic pictures on porcelain and similar products, consisting of the following steps:—First, producing a positive of the picture on a transparent sheet; second, depositing this transparent positive picture on the surface of a sensitized plate, coated with an adhesive and sensitive substance and exposing it from two to five minutes to the action of light; third, depositing on the surface of the sensitized plate some mineral color (such as iridium oxide) in fine pulverized state, spreading as much of it as will adhere to the surface; fourth, fixing the picture thus developed by a coating of collodion; fifth, dissolving the original sensitive coating of the transit plate, transferring the deposit of coloring substance to the collodion coating by ripping the edges of the collodion sheet, and immersing the plate in a bath composed of pure water to which a small quantity of sulphuric acid is added; sixth, washing the collodion sheet repeatedly in pure water, immersing in a solution of gelatine and spreading it with the side to which the deposit of coloring substance is fixed, upon the surface upon which the picture is to be reproduced, and drying the same thereon; seventh, removing the collodion from the surface of the picture by immersing it in a bath composed of equal parts of ether, oil of lavender and alcohol; and eight, fixing the picture to the surface of the porcelain by coating with grounding oil, depositing thereon an even layer of a glazing substance prepared in powder form and finally burning it in a furnace whereby the glazing substance is melted and transformed into glass.

581,207. Photographic Shutter. George W. Mills, New York, N. Y.,

A camera box is provided with a front opening. A shutter is pivotally secured within said box and on the front end thereof, said shutter having an enlarged rounded lower portion and an extension above the pivot A lever is pivotally secured on the front of the box above the shutter, the pivot of said lever being in vertical alignment with the pivot of the shutter, said lever being pivotally connected at its lower end, with the extension on the shutter, and having its upper end projecting above the top of the box through openings therein. Pins are arranged to prevent lateral movement of the shutter, and a flat spring is secured beneath the shutter and bears on the enlarged lower portion thereof to maintain the shutter in whatever position it is adjusted.

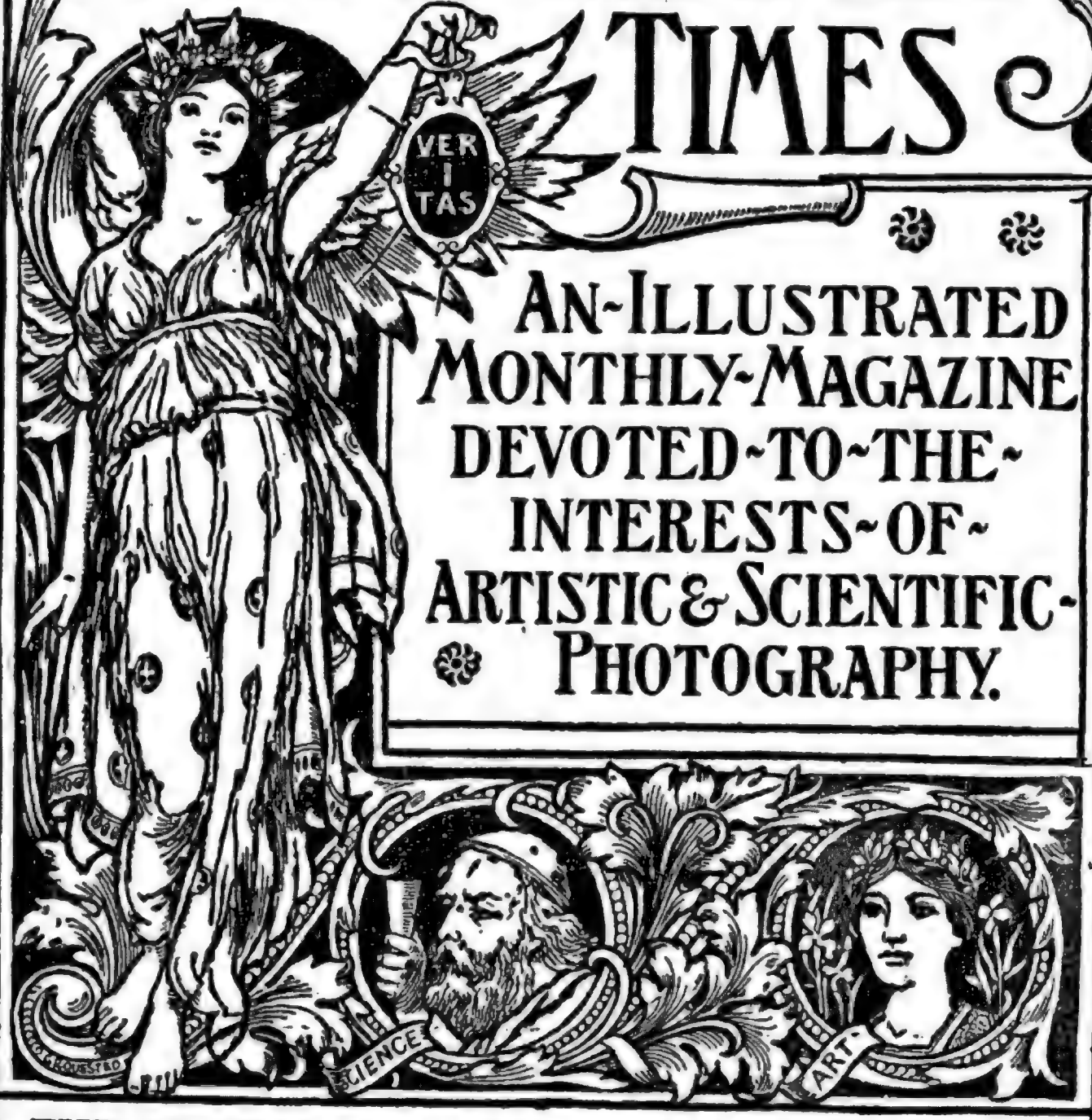
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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

JULY, 1897.

Number 7.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH ST. NEW YORK.

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THE
PHOTOGRAPHIC TIMES.

VOL. XXIX. JULY, 1897. No. 7

AUTOBIOGRAPHICAL SKETCHES.

BY H. P. ROBINSON.

CHAPTER III.

"The invention all admired, and each how he
To be the inventor missed; so easy it seemed
Once found, which yet unfound most would have thought
Impossible."—*Milton*.



LUDLOW CHURCH

I SHALL come to photography by and by, but the reader must recollect that at the time of which I am writing the wonderful art that now overshadows the world, was only known to a few learned men, and those who took interest in scientific curiosities.

Before I go on it may be well to call attention to my extraordinary luck of hearing little or nothing of photography, until I was well advanced as an artist, an advantage that can now very rarely occur to students. I was free from the distracting processes of photography until I was old enough to understand them, and of sufficient experience in art to use them for pictorial expression, so that although I had made a few simple experiments, and given sixpence for an ounce of hyposulphite of soda, and was not sure whether I required hyposulphite or hyposulphate, and the chemist could not help me, I had not possessed a camera until the year 1854, and came to photography when I began it in earnest, as an art-student who had given his best thoughts, and all his spare time since childhood to art, and had succeeded so far as to be able to paint a picture that was accepted at the Royal Academy.

Now, I am not quite certain at present, but I am inclined to think that the moral of these sketches is indicated in the last paragraph. It is that success in photography, especially pictorial photography, comes more from knowing what you want to do with your tools, and how to do it, than in how to make the tools and materials themselves, or to invent new ones. Another part of the moral is that the best way to achieve success is not to get complicated with the machinery to begin with. However much my readers may care for nothing but photography, we shall not get to much of any kind yet. I must keep them in mind that this is the story of the *formation* of a photographer, rather than of the photographer when formed. I hope to get to very active photography in time, but not for a chaper or two.

The year at which we have arrived was within four years of that era in the world's progress, 1839, in which both Talbot and Daguerre disclosed their processes, and it must be remembered that these processes were exceedingly rudimentary, and not nearly so perfect as is usually supposed. It was not until 1841 that photography on paper was more than a feeble printing process, or Daguerreotype fit for portraiture. In that year, however, Goddard quickened the Daguerreotype process, and Fizeau fixed the image and made it more dis-

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tinct, while Talbot had evolved Calotype out of his Photogenic drawing. This was the first *negative* process; a great advance, but still imperfect. But we read in "Lady Eastlake's Diary" of the "beautiful calotypes, landscapes, and portraits" of D. O. Hill, of Edinburgh, in 1834. Some of these must have been the beginning of that wonderful series published two years afterwards. A fine copy of this series of one hundred prints is in the possession of the Camera Club. The portraits especially are astonishing examples of the triumph of artistic knowledge over most intractable and imperfect materials, and almost make one wonder whether any process invented since was worth discovering, except for ease and comfort in working—not unqualified advantages. In 1844 also Talbot brought out the first part of the "Pencil of Nature." Yet the process was still in the hands of the inventors, discoverers and experimentalists, and not ready, except in a crude state for the practical man, and we may therefore leave it for a time, and return to my own simple annals.

In 1845 occurred one of those extraordinary chances which are seldom offered to anybody, and which I was not allowed to take. I have never yet been able, fond as I am of looking at the bright side, to decide whether my disappointment was for my good or otherwise. Anyway it was one of the compulsions that drove me in the direction of photography.

My desire was always to be sent up to London to fight my way as an artist. But this was far beyond the simple understanding at that period of any Ludlow person. Who ever heard of anybody going beyond ten miles of the town to earn his living? or at the furthest to Shrewsbury or Hereford? What was an artist? It was certain that his was a scampish sort of life, as might be seen by the itinerant limners who visited the town to paint ancestral portraits at a few shillings a head, beginning with the Town Beadle in his robes as a specimen. To be sure there was a portrait of a local magnate in the Assembly Rooms, painted by Sir Francis Grant, P.R.A., with the cut lemon, silver inkstand, immense pen, and stick of red sealing wax, without which no portrait of the time was considered complete. This was said to have cost as much as £150, but the enormous sum must have been because the painter was a Knight, and they wondered at his condescension in painting a portrait at any price. Then it was argued that the family had always kept itself respectable. Painting was all very well as an amusement, but give the boy a fair chance in the world, put a trade in his hands that he may always have something to fall back upon. This was the advice of well-meaning friends, and it prevailed. I was bound apprentice to a bookseller and printer for five years.

Now we come to what might have been a wonderful turning point. Alas! for the "might-have-beens," what a lot they leave undone, and undo us in the process.

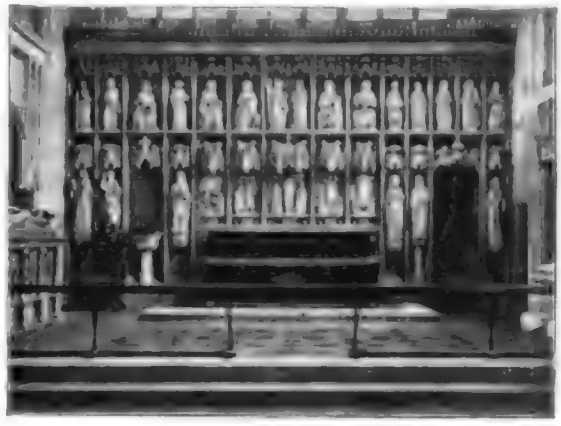
A wealthy gentleman much connected with art, was one of the rare visitors to the town. One day (in my dinner hour) he found me sketching, and sitting on the bank by my side, began a friendly chat. Looking through my portfolio he came to a design I had just finished, and some studies of single figures to be used in it. The subject was a most ambitious one—nothing less than "Fairies disappearing at the dawn of morning," containing forty or fifty figures! He called on me afterwards, and, I suppose, saw what he thought was promise underneath the poor performance, for after talking over my parents he went to my "master." The end of the interview was that he offered him a good round sum of money to cancel my indentures, that he may take me to London and devote me to art. It was refused—the paltry excuse that it was a business transaction, and I had made myself very useful in the office It does not do to dwell on this subject. I was *crushed* for a time, and no work or play of any kind, not even drawing, was to be got out of me, but I eventually recovered.

Now I cannot say that I did not enjoy my apprenticeship, for the employment soon became congenial, and I added to my knowledge enormously, chiefly on the literary side, and my rapid mental growth surprised myself. By good fortune the head printer (we had only him and two apprentices in the office) was a curious old man, full of out of the way knowledge, which he delighted to impart. But what slavery the work was! The hours would astonish a present day apprentice who, besides late opening and early closing, must have his weekly half holiday. In the summer we went to work at 7 o'clock in the morning and left at 9 at night; in winter an hour was knocked off each end. Perhaps two or three half days in the summer, to play cricket, could be begged, but were as often refused. In those days, however, an apprentice at least learnt the whole of his business, at the present time he seldom learns

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more than part of it, he probably also learnt cock-fighting, badger-baiting, and pugilism; but these are details of the customs of the times, which did him very little mischief if he had a healthy soul. In my case I circumvented the early hours of business by rising still earlier, and in the summer was in the little attic studio, in which I took great pride, by 4.30, or to an occasional cricket practice on Whitcliff. This was getting "up very betimes" as Pepys expresses it. Then there was always half of the dinner hour available, as well as an hour or two at night for reading.

A little episode belonging to the other side of my life comes into my memory and will conveniently fit in here, and perhaps afford a little relief. 'Prentices are famous in history for a turbulent disposition and skill in cracking heads and beating the watch, all for the fun of the thing. I will not say we were not as others; I think I do remember handbills posted about the town sometimes, offering small rewards for information about some of our innocent little delinquencies, and it is certain that one of us was killed by a policeman during a Fifth of November riot. This is how it happened. We were worthily doing our best to preserve a revered old custom, and old customs in this town were sacred. We were cutting down a fir plantation to make a bonfire in the castle square, for the Corporation, for the first time, in a sudden attempt at reasonableness, not suited to the town, had denied us the usual ton of coal which from time immemorial had been allowed for this patriotic purpose. A dozen of us were carrying a fir tree to the fire. The blow of the policeman's baton was intended for me, but I "ducked," and it found its billet on the head of the next boy, who died from the effects, some weeks afterwards. I remember fearing I should be prosecuted for manslaughter because I escaped. We gave him a splendid funeral as a demonstration.



THE REREDOS, LUDLOW CHURCH

This is no part of the education which prepared the photographer, of which I want to tell you, but, Lord, as Pepys says, a good fight for a good cause, *is* a liberal education of itself. As a rule we were, I fancy, unusually studious. Some of us formed a Chess and Book Club, and a Corresponding Society in which we bound ourselves, never mind against what difficulties, to meet once a year, meanwhile to deliver lectures weekly. I have some of the lectures now. They were on such subjects as Chemistry, The Barometer, Mechanics, Printing, Optics, etc., subjects at our time of life out of which we must have got good. The lectures on Heat and Chemistry were by a boy who is now a famous London Physician. I have lost sight of the others. If any one of them should happen to come across this present writing, I should be glad to hear from him. I thought a few touches of old world apprentice life may be interesting, but I need not follow the details of my experience as a bookseller and printer. The loss of time to art education was largely balanced by the extensive amount of reading I accomplished, and the quantity of odd knowledge I picked up; besides my disappointment at not being allowed to devote myself entirely to art, had the effect of making me feel less enthusiastic about it, although I did not give up the practice.

Another influence also was beginning to work. One of my predecessors in the office as an apprentice, perhaps ten or fifteen years earlier, was a studious youth named Thomas Wright, who afterwards was sent to College, took his M. A. degree, became a prominent member of various learned societies, and the author of many historical and archæological works. He was not a bad model to follow, and his example was tempting to youthful imagination. When I joined the office they were printing Wright's "History of Ludlow," an important job, which lasted through my time, This might have had some influence in turning my attention to writing, and besides taking every opportunity of contributing to the local papers, I wrote a lot of little histories, with sketches, of the Castles on the Welsh Border, some of which

appeared in the "Nooks and Corners" series of *The Illustrated London News*. One on Ludlow Castle was my first contribution to the press, apart from the local papers: this appeared in 1845, though done much earlier. Our old printer encouraged this taste, and made me practice writing tales and essays, many of which appeared in the *Hereford Times*. He was very particular about style, and as exercises made me imitate various authors. His favorite style was that of the Spectator, but for a change he made me try others. I well remember the opening words of one tale, called "A Lover's Quarrel," written in the stilted style of the Laura-Matbilda school. This is how it began. "No, Charles," said Maria, "I cannot submit to be thus catechised." That this effusion was published in *The World of Fashion* shows what rubbish was accepted by readers of that day. Wood engraving now occupied a good deal of my time, as well as etching. For these processes I had to make my own tools at a blacksmith's forge, and scrape and polish old plates and wood blocks. I also worked away at a process of color printing with combination blocks which had suggested itself to me, but gave it up for want of materials. It was reinvented some years afterwards. There was no encouragement in that office except for old methods "as was good enough for our fathers."

My time was not entirely given up to printing. I was to be a bookseller as well, and alternated between the departments. It was in the bookselling side that I made the acquaintance of the few magazines then published, and such new books as came to the town, but of course only with rapid glances.

The youth of to-day would be astonished at the difference in the matter of illustrated magazines then and now. There are no taxes on knowledge in our time to hinder progress. On the contrary, at the present time we swarm with and are swamped under illustrated papers, and photography is largely responsible for the increase. Our processes as yet can scarcely be said to have added to the art of the world. Photography has flooded the bookstalls with the worst illustrations ever produced by any art, and it is a most deplorable consideration that the fault lies not in itself, for the art is capable of producing delightful work. Terrible cheapness has banished quality, except for a few magazines such as the one in which I am writing, and at the same time the processes have deprived the *genuine* photographer of much of his work.

The Magazines were a meagre assortment. I need only mention the illustrated ones, and when I look into my memory I can only find the *Penny Magazine* and the *Saturday*. The forerunner of the illustrated press must have first place. The *Penny* did a noble work in its day. It was from this that I got my first impression of "an old master." It was in this magazine that I first became acquainted with classic sculpture, such as the "Apollo Belvedere," the "Laocoon," the "Dying Gladiator." It also reproduced the Cartoons of Raphael. I possessed a copy of "Du Fresnoy," and also of "Vasari's Lives" and "Jameson's Italian Painters," and was well read in the history of art, but had little opportunity of seeing engravings of the famous productions of the old men, and this *Penny Magazine* widened my vision. The *Art Union* is the only other illustrated magazine I remember, and I do not think a copy came to the town until I "took it in" myself, and it absorbed most of my pocket money. I still value the volume for 1847. Years afterwards, its editor, Mr. S. C. Hall, and his accomplished wife, were among my most esteemed friends. One other illustrated communication with the outward world came to us and lightened our darkness. The *Illustrated London News* first appeared in 1842, and I felt very proud when I saw bits of my own work in its early pages.

To conclude this chapter I have an incident, very characteristic of the time and the isolated position of the town in the world, to relate.

A short time before he was released from bondage the humble apprentice, chiefly through his contributions to the press, and on one notable occasion, to a learned London society, made acquaintances outside the local limits, some few of them famous in their several ways. But Ludlow at that time had very curious views. The "upper classes," although very kind and ready to patronize, were very strongly imbued with the notion that every one should keep his place "in that state of life" to which they firmly believed "God had called him," for it would be impious to go against the Catechism. They would have us sing night and morning,

> "Bless the squire and his relations,
> And keep us in our proper stations."

I don't impute this to them as a crime, or even as a fault, these sentiments belong to the time and place; the Ludlow aristocracy and its fringe had always been very kind to me, and it must always be remembered that the town at

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that time was quite fifty years behind the rest of the world. Therefore, they had a sort of prescriptive right to eighteenth century opinions. The result was that my father was remonstrated with on what was mildly called my forwardness, which meant presumption, and my liberty of action was in this respect curtailed for a time. When it is recollected that I was a shy, modest youth, as the portrait in the initial of chapter II. sufficiently indicates, pleased to be noticed, yet desperately nervous when spoken to, it will be seen how I felt this rebuke. I am afraid in these more enlightened days it will be difficult to believe this little episode. The occasion was this.

The altar piece of the Church was an oak screen of Corinthian columns, out of all harmony with its surroundings and obviously not belonging to the original building. This was removed early in 1849, and disclosed the original elaborately carved stone Reredos, from which the statues and ornaments had been ruthlessly taken and destroyed, probably by the Puritans. I made a drawing of what remained, and wrote a short, but what appears to me now curiously learned paper, beyond my present understanding, on the subject, concluding by suggesting a subscription for the restoration, and sent them to Mr. Wright who communicated them to a meeting of the British Archæological Association. It happened that there were present at the meeting, the Prince Consort,* the poet Rogers, Guizot, the Ex-Minister of France, and many other well-known men. This in some inexplicable way was the cause of the offense. The "Paper" was printed in the Official Transactions, and afterwards quoted in the local journals, and the dreadful offense did good, the subscription was got up, and the Reredos restored. This was the beginning of the complete restoration of the church, which might have made it more secure, but has not added to its picturesqueness.

The statues in the Reredos were carved by a sculptor—Mr. Blackburn—who used the side chancel for a studio. I spent a good deal of time with him, and at last thought I could carve a figure. After preliminary trials he allowed me to try my hand on a full sized block of Caen stone. His recipe for carving a statue was this. "*See* your figure in the stone and cut away all you do not want." The result may be seen in St. Paul, with the sword over his shoulder, to the right of the altar. But I must not claim all; the sculptor went over it after me. I had the misfortune to break St. Paul's sword twice, and it will be found to be cemented together.

* Prince Albert in after years was a good friend of photography and photographers. He made a very large collection and gave me a standing order for a copy of every pictorial photograph I produced. His Secretary, Dr. Becker, was also very intimate with photographers, and was a member of the first Council of the Society

DIFFUSION OF X RAYS. BY JAMES E. BOYD AND H. C. MOORE.

[*Ohio State University.*]

In some experiments with X rays, which we have been recently making, we found effects which seemed to indicate irregular reflection from the floor of the room. Accordingly we proceeded to investigate the subject of reflection from wood.

The arrangement of the apparatus is shown in the diagram. The screen of the fluoroscope was placed with its plane a little in front of the source of the rays, *S*. A brass bar was held before the screen. Two plates, one of iron and

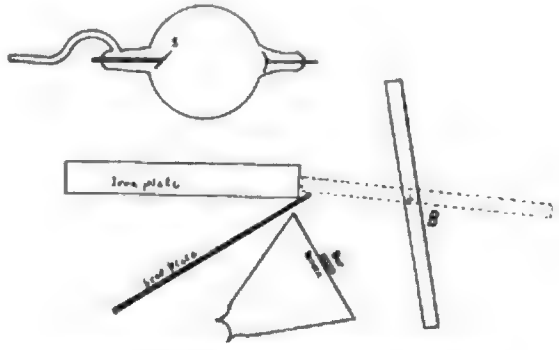


DIAGRAM SHOWING ARRANGEMENT EMPLOYED.

the other of lead, cut off the direct rays from the fluoroscope.

When the tube was working a faint fluorescence was noticed and the brass bar cast a distinct shadow, showing that the rays were coming from the front.

If now a board was placed in the position *B*, so as to receive the direct rays, the fluorescence was very much increased. This effect varied with the thickness of the wood. Two pine boards, each 1⅛ inches thick, gave a comparatively strong illumination, which appeared less bright when one of the boards was quickly removed. Apparently it made no difference whether it was the front or the back board which was taken away.

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RADIOGRAPH TAKEN WITH RAY'S REFLECTED FROM PARAFFINE, 30 MINUTES EXPOSURE.

We found, too, that if either of us stepped into the position *B*, the screen lighted up with a brilliancy equal to that produced by the two boards above mentioned.

From these results we inferred that bodies which are transparent to X rays are reflectors. Accordingly we tried paper with effects very much like those obtained from wood. The best of all was a block of paraffine about ten inches square and two inches thick.

When the reflecting body, *B*, was rotated about an axis, *C*, so as to vary the angles of incidence, we failed to find any position of greatly increased brightness such as we would get if this were a case of regular reflection.

When the bar was moved away from the screen, the dark center of the shadow became narrower and the penumbra broader, indicating that the source of light was of considerable area.

Using a large surface such as the floor as the reflector, and placing a plate of lead between it and the brass bar, we found, as the plate was brought up towards the screen, that the shadow of the bar spread out on all sides, showing that the light came from every direction.

These facts, together with the increase of illumination due to increased thickness of the reflector, show that we are dealing with an irregular reflection or diffusion of the rays. Other observers have found the same to be true in the case of the feebler reflection from the metals.

The body *B* was placed in the position shown by the dotted lines so that the rays must pass through it to reach the screen. Wood and paraffine were used and the results were much the same as those obtained by the backward diffusion.

A photographic plate was put in place of the screen and a radiograph of a key was made with paraffine as a reflector. The distance from *S* to *C* was about 14 inches and from *C* to the plate about 10 inches. The time of exposure was 30 minutes, and the result is shown by the accompanying reproduction.

THE USE OF SPECTACLE LENSES IN PHOTOGRAPHIC WORK. BY HENRY SKILLMAN CURTIS.

ALTHOUGH the art of picture taking has grown widely popular of late, and the number of its devotees is increasing steadily, there are still many who wish for the pleasures of the camera and are debarred because of the great cost of good apparatus. It is true that hand-cameras with lenses that give fairly good results, can be purchased for as low as ten dollars or even less, and for those desiring to work with small plates and short focus lenses, nothing further could be asked.

But if a large camera be used and a lens capable of covering sharply a plate, 6½ x 8½ or 8 x 10 inches in size, be desired, it will be found that the expense becomes a serious drawback. A good objective of the rapid rectilinear type, for an 8 x 10 plate costs from thirty to fifty dollars, which expense, added to the cost of the rest of the apparatus, places such an outfit entirely beyond the means of a number of would-be enthusiasts. The camera frame and bellows might be constructed by anyone with a little talent for carpentering and a few simple tools, but the lens, unfortunately cannot be replaced thus.

It was suggested by Prof. Rood of Columbia University, under whom I am working, that with a little care, a simple spectacle lens of moderate focal length might be made to do work that would compare favorably with that of the best and most expensive lenses on the market.

Some writers have discussed the use of spectacle lenses in photography, but the subject does not seem to have been followed up very fully, and the tone of such articles as I have noted, has been to discourage the attempt, on the ground that no satisfactory results could be obtained. I have found, on the contrary,

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that extremely good pictures may be taken with such lenses.

The chief difficulty encountered in the use of a simple, uncorrected lens, is caused by chromatic aberration. In other words, the rays of light which act on the photographic plate, *i.e.*, the actinic or chemical rays, are brought to a focus at a different point from that of most of the visible rays, which latter form the image on the ground-glass screen. The actinic rays belong to the violet end of the spectrum, while the visible rays belong to the central yellow region. Consequently, if the image formed by the spectacle lens on the ground-glass, be sharply focused by the unaided eye, and a picture taken, the negative will not be sharp, because the actinic rays are out of focus.

In expensive lenses there is no chromatic aberration, as the defect is corrected by combining glasses of different optical densities, so that the visible and chemical foci coincide. As this is not the case with a spectacle lens, some means must be devised for focusing an image which consists of the violet and blue rays only. This can be done in several ways, the simplest of which is to use a colored medium to look through when focusing. Such a medium should be of a color that will cut off all the red, yellow and green rays and permit only the violet and blue-violet to pass. A solution of ammonia-copper-sulphate will answer the purpose admirably. The solution should be enclosed in a small cell, with parallel glass sides, or in a small phial, if one can be procured with flat faces and glass of good enough quality to allow vision through it, without distortion. A still simpler means is by the use of a double thickness of cobalt glass, which may be purchased at any optical store. This medium has the peculiar property of cutting off the central portion of the spectrum and allowing the violet and a trifling portion of the red and yellow to pass. If two thicknesses be used, so little red will get through, that it will not be noticeable, and the image can be focused for the chemical rays. Cobalt glass may be tested roughly, by looking through it at any bright red object. If the color is good, the object should appear very dark blue, almost black. Any glass which permits much red to be seen through it, is unfit for this use and must be discarded.



TAKEN WITH A SINGLE SPECTACLE LENS OF 24 INCHES FOCAL LENGTH, ON 8 X 10 "NEW YORK" PLATE, DIAMETER OF STOP $\frac{1}{4}$ INCH, EXPOSURE 4 SECONDS NEGATIVE BY H. S. CURTIS.

The picture thus focused by means of the solution or the cobalt glass, will not appear absolutely distinct to the unaided eye, but will give a sharp photographic image on the plate.

In using the spectacle lens it will be found necessary to stop it down somewhat, but modern

dry plates are so rapid, that a small stop can be used with good results. The picture of the cathedral which accompanies this article, was taken on an 8 x 10 plate, with a spectacle lens of twenty-four inches focal length. The diameter of the stop used was about the fifth of an inch, and with an exposure of four seconds the plate was overexposed. Thus it is evident that for ordinary work, the action of such a lens is quite rapid enough. The picture, it will be seen, is perfectly sharp, and will, I believe, bear comparison with results obtained from expensive lenses. The image is free from distortion. An architectural subject was chosen in order to give the objective a severe test. In landscape work a larger stop could be used with a correspondingly shorter exposure.



TAKEN WITH A SIMPLE SPECTACLE LENS OF 24 INCHES FOCAL LENGTH, ON 8 X 10 CARBUTT "E" PLATE, SENSITOMETER 16, DIAMETER OF STOP ¼ INCH. EXPOSURE 6 SECONDS. NEGATIVE BY H. S. CURTIS.

Simple lenses of less than fifteen inches focal length, are unsuitable for large plates as the curvature produces considerable distortion, but this objection is not serious, as lenses of longer focus are generally used with such plates, and give far better proportion and perspective.

I have found that the meniscus or concavo-convex lens acts with somewhat better definition than the double convex. When used, the concave side should be placed towards the scene photographed. The double convex lens, however, will give very satisfactory results. The cost of ordinary spectacle glasses is about ten cents apiece. Mounted in a simple wooden cell, they will work admirably. It is a good idea to have several such lenses at hand of different focal lengths; the objective can then be selected to suit the object. If a finely mounted lens be already possessed, the spectacle glasses can be cut to fit the same tube, and slipped into place with a wire ring.

The solution of ammonia-copper sulphate, above mentioned, may be made as follows: Take a small quantity of saturated solution of copper sulphate; two or three fluid ounces will be sufficient. Add strong aqua-ammonia till the precipitate at first formed is redissolved. Filter, and the fluid is ready for use. Dilute with water, till objects can be seen clearly through it when it is in the cell, or receptacle which is used. The cobalt glass described before, is of course more convenient, and will answer the purpose fairly well if a good quality is obtained. The solution, however, is perfect in its action.

Although the use of a spectacle lens in photography involves the necessity for a little more trouble and care in focusing, yet on comparing its cost with that of a high-class objective, the difference, it seems to me, will more than compensate for any slight additional difficulty of manipulation.

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USE OF ALDEHYDES AND ACETONES IN DEVELOPMENT—EXPERIMENTS OF MESSRS. LUMIERE AND SEYEWETZ.

BY A. B. AUBERT.

THE addition of formaldehyde greatly increases the reducing power of a developer. This fact has been known for some time; its *mode* of action was, however, unknown.

From the experiments of Messrs. Lumière and Seyewetz it is proven that formaldehyde is not the only one capable of acting. The presence of sodic sulphite is indispensable, as its replacement by other alkaline reacting salts, such as the acetate or neutral phosphate, hinder the production of increased developing power.

Most of the aldehydes and acetones give rise to the same phenomena to a greater or less extent.

Indeed, an interesting fact has been brought to light, *i.e.*, that the latent image may be developed by the use of a phenolic developer, like hydroquinone, without the addition of an alkali, provided, however, sodic sulphite and an aldehyde or acetone be present. Messrs. Lumière and Seyewetz offer the following explanation: they claim that a compound of the aldehyde or acetone is formed with sodic bisulphite, a more or less large quantity being produced by the formation of an alkaline phenate at the expense of a part of the alkali in the sodic sulphite. The following would be the reaction in the presence of hydroquinone:

$$2\,CH_3 - CO - CH_3 + 2Na_2SO_3 + C_6H_4{}^{OH}_{OH}$$

$$= 2\,(Na\,HSO_3,\,CH_3 - CO - CH_3) + C_6H_4{}^{ONa}_{ONa}$$

To demonstrate the exactitude of this view, the experimenters draw attention to the fact that aldehydes and acetones do not combine with sodic sulphite. They tried, but without success, to isolate the combination of aldehyde or acetone with the bisulphite. However, by evaporating in vacuo a mixture of solutions of sulphite, acetone, and hydroquinone or pyrogallol they obtained dry crystals, which, boiled with alkali, liberated small quantities of acetone; a result not obtainable in the absence of a phenolic compound, that is, by the action of acetone and sodic sulphite alone.

Now if we try to extract the phenol with ether from the alkaline sulphite solution the results vary according to the presence or absence of acetone.

The following solutions were prepared:

	I.	II.	III.	IV.	V.
Pyrogallol			2.5 gr.	2.5 gr.	2.5 gr.
Hydroquinone	3 gr.	3 gr.			
Sod. Sulphite	8 gr.	8 gr.	8 gr.	8 gr.	8 gr.
Acetone		3 c.c.	3 c.c.	3 c.c.	3 c.c.
Water	125 c.c.	125 c.c.	125 c.c.	125 c.c.	125 c.c.

Extracting with the same volume of ether in each case the following amounts of the phenols were obtained:

Solution I, 2.2 gr. of hydroquinone.
Solution II, 2.0 gr. of hydroquinone.
Solution III, 1.05 gr. of pyrogallol.
Solution IV, 0.8 gr. of pyrogallol.
Solution V, 1.05 gr. of pyrogallol.

By previous experiment it was ascertained that the same amount of acetone in aqueous solution was without action upon the solubility of phenol in ether. The above results show, however, that, in the presence of sodic sulphite, the acetone causes the retention of a part of the phenol.

To show that alkali may be liberated owing to the formation of the acetone or aldehyde compound with bisulphite, the following solutions were made:

	I.	II.	III.	IV.
Hydroquinone	3 gr.	3 gr.	3 gr.	3 gr.
Water	125 c.c.	125 c.c.	125 c.c.	125 c.c.
Sod. Sulphite	7 gr.	7 gr.	7 gr.	7 gr.
Bisulph. acetone	1 gr.	1 gr.		
Sod. carbonate	0.37 gr.		0.37 gr.	

0.37 gr. of sodic carbonate represents the alkali which would be set free by the formation of 1 gr. of bisulphite acetone compound.

Solution I, slow development, image visible in 10 minutes.

Solution II, no development, no image after 10 minutes.

Solution III, slow development, image shows up in four minutes.

Solution IV, no development.

From these results it would appear that the small quantity of alkali has favored the development in solutions I and III, the presence of bisulphite retarding No. I. The results obtained tend to prove that the reaction may, in part at least, be expressed by the equation given in the early part of this article.

The action of acetone mixed with some of the common developers was tested with the following results:

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From "*The Inland Printer.*"

Half tone from Photograph by Electro-Light Engraving Co., New York City.

THE TERRACE, CENTRAL PARK.

	I.	II.	III.	IV.	V.
Hydroquinone...	2.8 gr.				
Pyrogallol.....		2.2 gr.			
Paramidophenol..			2.8 gr.		
Paraphyenlene diamine.....				2 8 gr.	
Sod. sulphite....	7 gr.	7 gr.	7 gr.	7 gr.	7 gr.
Acetone.....	3 c c.	3 c.c.	3 c.c.	3 c.c.	3 c.c.
Water.....	125 c.c.	125 c.c.	125 c.c.	125 c.c.	125 c.c.

No. I, slow development, acquiring density.

No. II, rapid development.

No. III, fairly rapid development.

No. IV, slow development, lacking density.

No. V, no development.

In the above examples pyro gives the best results.

By modifying the proportions, developers having varying properties as regards rapidity, etc., may be obtained.

Messrs. Lumière and Seyewetz give the following as a good formula :

Acetone.....	10 parts
Water	100 parts
Hydroquinone.....	3 parts
Sod. sulphite.....	10 parts

The negatives obtained by the use of this developer are fully up to those obtained by the use of alkaline developers.

BAS-RELIEF PHOTOGRAPHY. BY E. J. PRINDLE.

The object of all pictures (except those of the impressionist school) is to produce on the eye the same sensation as that which results from viewing the subject itself, and that picture is the most perfect which comes nearest to a complete deception. The stereoscopic photograph reproduces the relief of natural scenes and objects in a satisfactory manner; but the picture is very limited in size, which interferes with its being successfully colored by hand so that it can stand the magnifying of the stereoscope, and it must be viewed by means of the stereoscope, which is an inconvenience.

About twenty-five years ago the idea was originated of attempting to produce actual relief in the picture itself. A number of forms of hand presses was invented in which the photograph was subjected to pressure between an elastic bed of convex form and an open die, so that the whole surface of the photograph was given a convex form like a shield or a cameo. One of the best examples of this form of press is that shown in Fig. 1. The oval bed plate is provided with a rim, in which is seated a rubber block having a convex upper surface. Two standards rise from the bed plate and receive the ends of a rod on which is journaled a hand lever, whose forked lower end carries

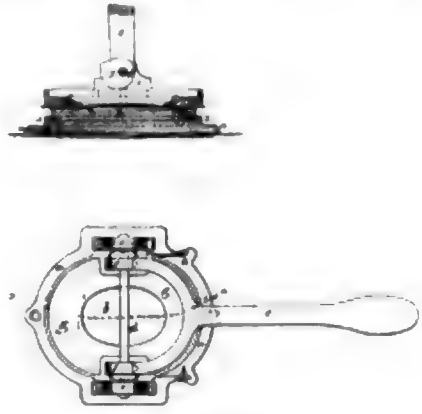


FIG. 1.

two cams. These cams act on the upper side of an oval die, which is open at the center and which is mounted on vertical guide ribs on the standards. A spring on each side holds the

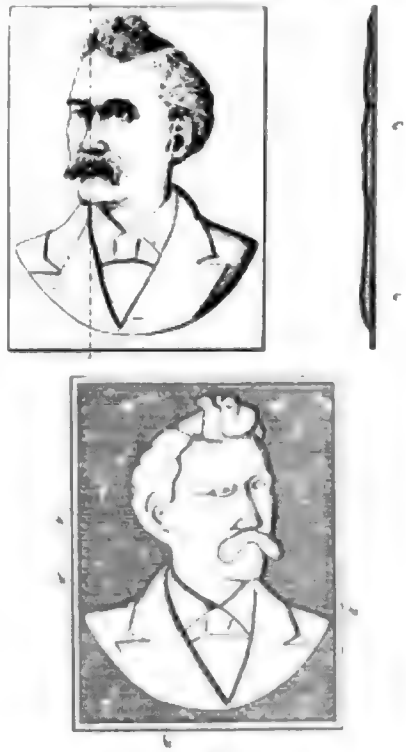


FIG. II.

die up above the bed plate, except when it is depressed by the cams. The damp photograph, suitably backed, is placed between the rubber block and the die, and it assumes the form of

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the block when the die is depressed and retained in place until the picture is dry. Pictures made in this way are quite popular even at the present time.

No change of any importance in relief photographs was made until year before last, when the "bas-relief" photographs were brought out. In these, the picture as a whole is not given a

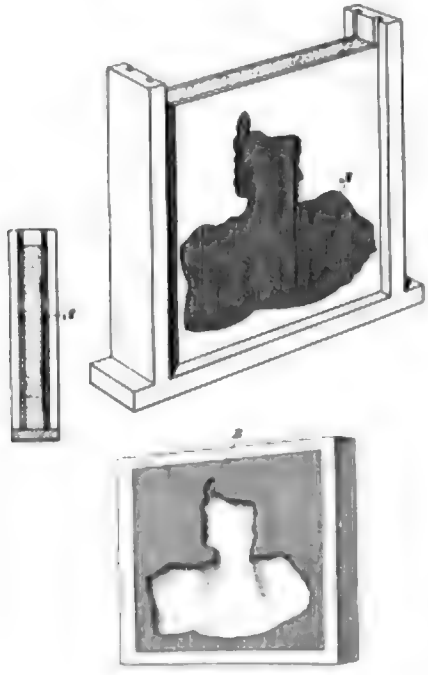


FIG. III.

uniform convexity; but the true contour of every feature of the picture is reproduced in low relief. Drawings illustrating a picture of this kind in front view and in cross-section and also the mould for producing the picture are shown in Fig. 2. An ordinary negative is made from the subject, and a print therefrom is pasted on a block of wood. The wood is cut away to follow the outlines of the subject carefully; and the principal features are sunk deeply into the block, the minor features being sunk in due proportion. The mould is carefully smoothed and is surrounded by a frame, to accurately place the print to be finished. The latter is mounted on a soft quality of cardboard and after being moistened is placed in the mould. A sheet of sponge rubber is placed on top of the print, and the whole is put in a press, thus forcing the print to take the contour of the mould. When it is dry the print is removed; and, if desired, its concave back is filled with wool or plaster, after which the print is mounted. The writer has before him some pictures made by this process, the gift of the inventor, Mr. F. A. Taber, of New York, which were colored by the deft hand of a Japanese, and which combine the perfect detail of the ordinary photograph with the relief of a statue and the colors of the subject in such a way that, with the proper arrangement of lights, the figure throws actual shadows; and the effect is so realistic as to puzzle the observer to tell whether he sees the real object at a distance or a picture near by.

Various modifications of the process just described have been invented. In the method illustrated in Fig. 3, the outline of the portrait is cut around so that it can be removed from the picture, and the portrait is pasted on the surface of a piece of glass which forms one side of a mould in which a plaster block is to be cast, which block is to form the mould for the picture. When the mould is taken apart, the plaster will have received the impression of the paper and will thus have been given the outline to be carved into its surface. The print

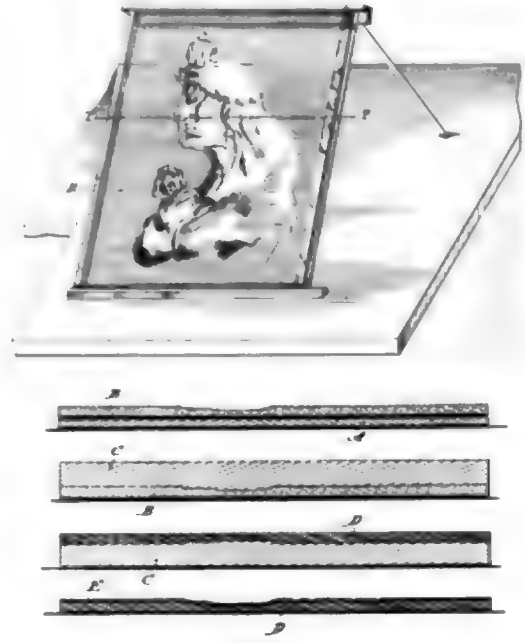


FIG. IV.

from which the outline was cut is now pasted on the plaster block, to assist in registering the prints which are to be made into bas-relief.

A method of producing the mould, in which the bas-relief pictures are formed, is shown in Fig. 4. A block of gelatine or similar translucent substance is laid over a negative that is lighted from behind, and the mould is carved

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into the surface of the block with the advantage that the outlines and details of the subject are before the operator during the whole of the carving. A plaster cast is now made of the gelatine mould, and from the cast a second mould of substantial material is made, and it is in this mould that the bas-relief pictures are made.

In Fig. 5 is illustrated a method producing bas-relief photographs without the use of a mould. In this case the relief is produced by working on the back of a moist print with an embossing tool. The photograph is mounted

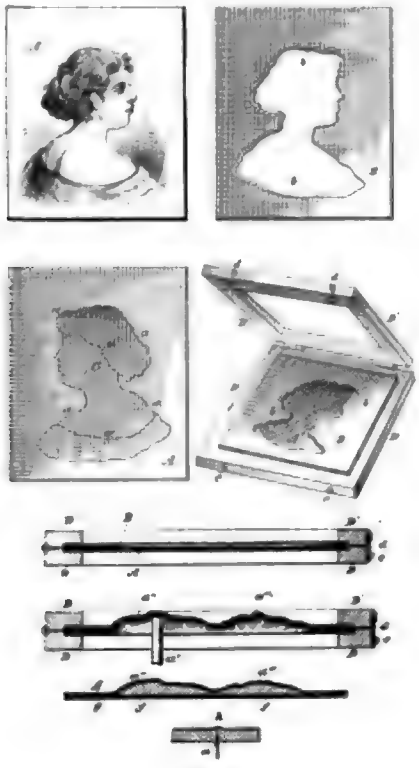


FIG. V.

on cardboard, and the mount is cut on the back along the outlines of the figure, the cut not being deep enough to reach the print. The path of the cutting tool can be followed by the raised line which it forms in the surface of the print. Such principal lines as those of the clothing and of the hair across the face are also followed with the cutting tool. These cuts relieve the print of the restraint of the mount where it is desired to form the bas-relief. A second mounted print is cut entirely through along the outlines, so that the figure can be removed, leaving an opening of the shape to be thrown into relief. The cut-out is now placed over the print to be finished, and the two are clamped together in a frame. With an embossing tool the back of the moistened print is worked up through the cut-out into the desired relief.

Bas-relief photographs are steadily coming into greater use, and, when the price can be brought within the reach of the average person, are destined to enjoy a wide popularity.

COMPOSITION. BY G. DAVISON.

AMONGST photographers the word composition is used with a variety of meanings. In its most common application it is made to refer solely to the arrangement of the main lines and the boundaries of a photograph. This is a mistaken restriction. We constantly hear it said that the composition of such and such a picture is unpleasant because it requires more off the foreground or because a roadway or river-course is traveling out of the picture. This may be all very well as far as it goes, but it is elementary and incomplete, and in such criticism one is generally aware that the observation and knowledge goes no further.

Composition is not only a matter of the placing together of lines or outline boundaries and of masses of light and dark in a space, but it also concerns the entire disposition of objects to tell a story or describe a scene. In graphic representation it is personal selection in every particular of arrangement of line and light, of relative definition, relative tone, and of expression—figure of man or face of nature—and it involves, all through the artificial or personal combination the keeping of the main motive, the sentiment of the subject, uppermost in the illusion.

Such works, to deserve the name of compositions, must have a motive personal to the author, and some feeling. Photographs are frequently presented for criticism about which it is simply impossible to say anything from an æsthetic point of view except that they are not compositions at all. There is no subject in them, no pictorial conception, no imagination or sentiment, no decorative aim or knowledge, no emotion stirred, no particular reason for anything—they are simply lists of objects, mere mechanical transcripts.

The difference between such a representation and a good picture is the difference between a

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catalogue and a telling story with subtle analysis of character, or between a newspaper record and a fine prose composition or poem. The catalogue has its useful place but ought not to be presented for criticism as classic literature.

It may be true that some element of composition must enter into the production of every representation however limited the thought. For it is almost impossible that any worker can learn to employ a means of picturing without gathering a few ideas concerning subjects to be selected and the best way of showing those subjects. In these matters the question of degree must always be very prominent.

The photographer is in the peculiar position of having placed in his hands the power of making very complete representations without necessarily having to think and select. He does not start with the simplest of objects, studying its form under varying conditions of light and shade and comparing the graphic results with his mental impression. It would be better if he did. He generally pursues from the outset a course of complicated subjects, accepting what his procedure gives him too much without criticism or attempt at modification. His tendency is to forget more than half of what is involved in composition and to fall into slavery to his tools.

As a matter of fact manual skill is of little use unless the worker has something worthy the telling. Such a state of things is craft without art. When a practitioner in any art craft has acquired his proper technique and knows the use of his tools and what they will do for him there still remains the important part of how, when, and where he shall apply his dexterity. What shall he select or conventionalize? How shall he give expression to his own impressions of human form, human character and relations, or of nature's appearances and moods.

His practical answer to this enquiry is the artist's composition. He picks out and places together statements or suggestions of those facts which his own observation, feeling and analysis induce him to select. The education which leads to his selection is the education of his life, the moulding of his surroundings, natural and artificial.

The way in which he orders this technique, observation, and feeling to tell a story, fill a space, design a pattern, describe a person, scene, incident, or effect, is composition. And in this view it will be promptly evident that it would be absurd to seek to deduce any absolute rules of arrangement or to give the particular practice of any artist or artists the prominence of laws.

This remark holds with regard to classes of art which must be frankly graphic and simulative, such as landscape and portraiture, even more strongly than it does to the purely suggestive conventional and decorative sections. But even in the department of applied decoration there are no possible rules for ordering subtle and convincing suggestion by means of a limited technique of lines and unmodelled masses of shade. Every successful design has its charm in its surprise, in its simplicity and fitness, the result of complex thought and a power of abstraction and refinement that defies classification.

To crystalize the methods of any man or school in the form of rules for guidance does more harm than good. It may be possible that that in time some small scientific base may be agreed upon to connect the sense of pleasure with certain line and color compositions, but that time is not yet, and, where the number of circumstances to be used decoratively and the proportions of shapes to be filled are infinite, pleasure must wait solely on fitness and fitness upon a thousand thoughts and feelings.

Some time back a statement was made in the photographic papers, that there could be no composition in photography, only selection. The remark was made in a discussion and was reported without any context, so that it is not easy to criticise the position taken up by the speaker. Without his definition of the word it may be fighting in the dark to take exception to the attitude. At the same time it is difficult to see how any reasonable meaning whatever can be put upon the word which shall altogether exclude photography. It is true a definition might be constructed which would limit the possibility in photography somewhat narrowly. Some persons for instance have the feeling that nothing is really worthy the name of composition without color scheme and harmony.

But leaving the large and increasing world of black and white art as its own justification as a whole, how can photography be specially excluded from this group? Take an extreme case. Let it be supposed that the word composition implies a new ordering and arrangement of facts or impressions gained from a variety of experience, and upon different

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occasions, in other words a combination of several sketches or memories. This will be no impassable barrier. The degree to which it is actually practised does not affect the principle. Combination photography has given results fully equal in essentials to the domestic genre pictures of the painters' galleries, and a photographer may in a wide range of subjects bring together properties and apply lighting in harmony with previous experiences, thought or fancy.

To say that the impression in the photographic print is not the impression of the mind is a doubly assailable position. Some find that the impressions *are* alike, and at least it is a matter for personal opinion. If the operator consciously affects in any degree the qualities of his final print in respect of line arrangements, light and shade, and cloud harmony, to mention a few points only, it must be so far his composition.

It becomes a nicer question when the discussion turns upon the local selection and simplification possible and practised throughout very minute passages of artistic work. But this again is a matter of degree. Composition and selection cannot be restricted to a point of practice, which after all, when practically tested, is found to consist chiefly of generalization.

The contention, however, that there can be no composition in photography hardly seems worth serious discussion. The word composition will not bear the strained interpretations we have put upon it for the sake of argument. It refers to the whole work and to every part of the work, to selection of instance and point of view, to control in exposure, focusing, development and printing, to ordering the background to the figure, to posing and lighting for character and arrangement of line and mass, to sympathetic calling up and seizing of expression, in short to every thought and act all through in the production of the illusion which we call the picture.

Any hard and fast distinction between selection and composition in art work is an impossibility. Both involve ordering and arrangement of parts. Whether the selection and composition be set down by brush and pencil or by lens and printing does not affect the principle. The camera could not do it without the man and no two men could or would independently produce the same composition.

If further evidence were needed let ocular proof carry some weight. Compare, under circumstances as nearly similar as may be, half-tone reproductions of good landscape pictures which have been produced by painting and by photography. There have been many examples of half-tone prints before us in the picture magazines. Take the instance of work by such a good painter as Mr. Alfred East. Its similarity in its reproduced dress to what we are accustomed to in good photographs is quite convincing. Hardly anyone will deny the presence of composition in the print from the painting. And in the photograph will be found something of all the qualities that go to make the print a composition. Why, then, strain to make distinctions which practical results will not warrant?

In a composition there may be a pleasure in the subject, a pleasure in the effective way in which the artist has seized the sentiment of nature, that is, has presented our own unwritten or undefined feelings about the subject, and a pleasure in what may be called the decorative message of the picture.

The pleasure in subject may be quite distinct from any conscious æsthetic consideration, as in many popular pictures of the story-telling class But even in such cases there is plenty of scope for arrangement and there may even be said to be a special kind or quality of composition required to produce the particular excitement for which the patrons of this order of pictures crave.

In every class of work it is difficult to separate the various feelings of pleasure. In the finest works the manner is intimately part of the matter, and the proportions and decorative harmony are essential to the whole effects. No picture can be a very perfect work unless it speaks in all three voices as one. If the subject matter be trivial only a trivial manner can save it from incongruity. Whether in portraiture or landscape one finds it difficult to deny the importance of a distinguished and characteristic instance. This is seen plainly in the general agreement to admire the picturesque type, the furrowed features and white locks of age or the charm of feminine youth and beauty, even when the treatment is commonplace and out of keeping. In portraiture and landscape the beauty of the work of art is in the character and in the force of its statement, complete and harmonious within its boundaries, wearing its limitations as it were a perfect freedom, like finely ordered music.

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The beauty and distinction of instance need not, however, be judged by a popular standard of prettiness. In a portrait picture it matters not if a man be ugly as the world counts ugliness. The chief feeling of æsthetic pleasure lies in the powerful and expressive rendering of strong typical character. It is indeed quite consistent with aversion for the disposition or conduct portrayed. Tragedy and comedy may alike be pleasing, each calling for its appropriate key, phrasing and touch throughout, for, in short, a composition suitable to the theme.

In landscape and in all work where the idea of graphic representation is uppermost the first and foremost quality must be that of natural sentiment. Whether it be the feeling of figures seen through lacing branches, the movement of waters with reflections, or of wind upon grasses, the suggestion of evening calm or noontide brilliancy, or the expression of character in portraiture, the keenest pleasure comes from the subtlety and perfection of the illusion. Not, be it understood, necessarily perfection or completeness of the details of the objects in the representation, but rather convincing expression of the general feeling of that particular phase of nature or personal character which has been made the motive of the picture.

Whilst however insisting on this quality of naturalness of sentiment as of greatest importance in graphic picture we have no intention or desire to minimize the importance of the decorative arrangement. Every good picture must be decorative as well as graphically representative. Indeed in the best examples, as already stated, the two parts are inseparably united and merged. There is a reason in the subject motive itself or in the effective concentration of interest upon it for the disposition of every part in the space filled. The subject must dictate the space design.

UTILIZATION OF WEAK AND FLAT NEGATIVES. BY C. H. BOTHAMLEY.

Everyone probably at one time or another, by reason of accidental overexposure or from some other cause, gets negatives that are so very thin and flat, or at any rate so very flat, that no ordinary printing method, and no sort of dodging, will give even a decent print. Of course, if the same subject can be taken again, such negative are at once thrown away, but it sometimes happens that the exposure cannot be repeated, whilst for some reason or other great value is set upon the particular photograph, and no trouble is regarded as too great if only good prints can be obtained as the outcome of it. There are two ways of attacking the difficulty; one is to make a dia positive, and then a second negative, endeavoring at each stage to increase the contrasts and vigor, the other is to employ some special printing process

Various methods of negative reproduction are well known. The ordinary plan is to make a transparency on an ordinary slow gelatinobromide plate, exposing to a weak light, taking care not to over-expose, but rather the other way, and then giving a full development with a developer sufficiently restrained to keep the shadows clear and avoid anything of the nature of general fog. The ferrous-oxalate developer is very useful for purposes of this kind. If the contrasts in the transparency are still very weak, it may be intensified either with mercuric chloride followed by the ferrous oxalate or hydroquinone developer, or with the uranium intensifier, the latter being especially valuable for such purposes as this. It will be understood, of course, that the full advantage of such intensification will not be gained unless the transparency is quite free from fog or veil of any kind. When making the second negative from the transparency the same general lines are followed, and if the processes have been carried out thoroughly and with care, the new negative ought to be a good deal better than the original. If it is not yet good enough the various stages can be repeated, a transparency being made from the improved negative, and a third negative from the transparency.

For purposes such as those just described it is very important, especially in difficult cases, to use plates that (1) have a very fine grain, (2) can give a deposit of good opacity, and (3) are somewhat transparent, so that even a feeble light can penetrate the film for a relatively considerable distance. No dry plates satisfy these conditions so well as pure gelatinochloride emulsion plates, such as are used for the preparation of lantern slides, and it is an additional advantage that by suitable exposure and development an image can be obtained that is red or brown in color, and therefore is very opaque to photographically active light.

We have described this method because it involves the use of plates and processes with which most photographers are familiar, and at

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the same time admits of considerable modifications at the various stages. There are, of course, other methods, and excellent results can be obtained with the wet collodion process in the hands of a photographer thoroughly familiar with it and its capabilities. The production of the intermediate transparency by the carbon process has also advantages, but, generally speaking, gelatino-chloride or slow gelatino-bromide emulsion plates, with a substantial backing of patience and brains, will do everything that is practicable.

The opposite methods of employing some printing process that will give prints much stronger in contrast than the negatives are probably less familiar. Certain methods of modifying printing papers in order to adapt them to different classes of negatives and results, are of course, old and very familiar, but the range of modification is not very wide, and it is comparatively recently that methods have been proposed that seem capable of dealing with extreme cases.



BENIGHTED BY L. L. PEDDINGHAUS

It is clear that what is wanted is a paper capable of giving deep prints, and yet yielding a very much shorter range of gradation than the ordinary papers.

This requirement seems to be met to a very considerable extent by introducing into the sensitive film certain substances that have oxidizing or halogenizing properties, and therefore tend to reverse the action of light. It is clear that with a weak light the reversing action may be the stronger, whilst with a somewhat more intense light the action of the light may preponderate, and with sufficient exposure produce a deep image. The addition of a small quantity of potassium bichromate to the salting mixture for plain paper was recommended by G H. Moss in 1895, and he stated that the contrasts in the prints become greater the higher the proportion of bichromate. In the same year Valenta observed similar phenomena with collodio-chloride print-out paper. His method is very simple, and consists merely in adding a small quantity of chromic acid or calcium, or potassium-bichromate, to the ordinary emulsion. From one to two parts of ammonium-bichromate in one thousand parts of emulsion gives a very great contraction in the scale of gradation. One drawback to the method is that the prints fall off very much in intensity in the toning and fixing bath, and therefore have to be somewhat deeply over-printed, which introduces an element of uncertainty into the results until experience has shown how much over-printing is necessary.

In a later paper Valenta describes analogous methods, in which salts of copper or salts of uranium are used in place of bichromates, and

he claims that in this way a short scale of gradation is secured (or, in other words, strong prints from flat negatives), whilst the falling off in intensity observed when bichromates are used does not take place to any marked extent provided that certain simple precautions are observed. The only alteration required in the ordinary formulæ for print-out collodio-chloride emulsion is the substitution of cupric chloride (in equivalent quantity) for part or all of the chloride generally used. Nothwithstanding the shortening of the scale of gradation, it is stated that the rapidity of printing is not materially affected. The chief precaution necessary in the subsequent manipulations is very thorough washing before toning. If this is not done there is a very marked reduction of the print, but if it is done there is no great falling off, although a certain degree of over-printing is necessary.

The substitution of uranylchloride for part of the ordinary chloride in the emulsion has even a more marked effect, and the degree of contrast obtained depends on the proportion of the uranium compound used. By varying these proportions great control can be exerted over the character of the results. The paper is a little less sensitive than ordinary celloidin paper, but prints fairly quickly, and the intensity of the print falls off very little in subsequent operations. It is stated in some of the Continental photographic journals that papers of the kind indicated, but more especially those containing bichromates, can now be obtained commercially, but we have not seen any announcement of their sale in this country.

It is obvious that since any of the print-out emulsions can be coated on glass, the methods lend themselves to the production of transparencies, from which negatives can be made in the same way, the reproduced negatives differing very markedly from the original in gradation and vigor.

The latest contribution to the question comes from H. Pabst, who applies the same principal to that most familiar of processes, the albumenized paper process. There seem to be difficulties in the way of adding bichromates to the albumen before coating the paper with it. At any rate, Pabst describes a method that can be applied by anyone who knows how to sensitize albumenized paper. The paper is first floated on a bath containing sufficient alcohol to prevent any of the albumen being dissolved, half a per cent. of common salt, and in every one hundred parts of the bath from two to fifteen parts of a solution of ammonium bichromate (1 : 100) according to the degree of contrast desired. The paper is slowly dried in the dark, and is then sensitized and dried in the usual way. It must be strongly over-printed, and should be toned in a sulphocyanide bath. Since the albumen is less pervious than under ordinary conditions, a considerably longer time should be allowed for fixing.

How far these methods can be carried out with uniformly certain results, experience alone can show. It seems certain, however, that they may, with proper care, be made to do a photographer excellent service when he finds himself in the predicament to which we referred at the outset.—*Photography.*



Flashlight Photograph. By John A. Grant.

"GOOD NIGHT, PAPA"

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A GREAT PHOTOGRAPHER. BY IDA M. TARBELL.

(From McClure's Magazine.)

PHOTOGRAPHY is treated so generally as an art in which a machine does all the work, that it is difficult to believe that some of the greatest portraits of our time have been produced by this medium. It is true, however, that the ideal requirement of a portrait—to give a glimpse of a man's soul—has never been more nearly satisfied than by a few photographs made several years ago in England by Mrs. Julia Cameron, and by a large number made in the last few years in New York by Mr. G. C. Cox. Of Mrs. Cameron's work this magazine has already given its readers some specimens.* The present article is devoted to that of Mr. Cox.

So quietly has Mr. Cox's work been done that, except to a limited public particularly interested in purely artistic results, it is unfamiliar. He has never sought general recognition. Conscious that what he was striving to attain would be understood by only a few men, he has worked for them alone, seeking their criticisms and suggestions observing closely the effect on them of what he had done.



From McClure's Magazine. G. C. Cox, Photographer.

WALT WHITMAN

To appreciate this method of work, one should have a sitting in his studio. The ex-

*McClure's Magazine for December, 1893.

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perience is altogether unusual. One does nothing as in the conventional studio. He is not posed. He is not bidden to look at the "upper right-hand corner" of anything. He is not asked to smile. He is not made to keep quiet while a watch ticks out an interminable minute. As for the camera, it seems hardly to come into the operation. Probably many persons have away and the emotions allowed to chase freely across the face, no characteristic picture is possible. His first effort then is to get rid of the non-committal mask; to make the subject forget himself, the camera, his mission at the studio.

An ordinary man could not do this, but Mr. Cox is no ordinary man. He is original, sin-



From McClure's Magazine. G. C. Cox, Photographer.

ELEANORA DUSE.

had a series of portraits taken by Mr. Cox, who afterwards were unable to tell without an effort where the camera stood and how it was operated. All this is natural enough if one understands what the artist is trying to do. His treatment of a sitter is founded on his theory that all men purposely or unwittingly wear a mask, and that unless this mask can be torn cere, witty, and in profound earnest over his work. The subject who comes to him prepared to pose is surprised to be greeted with what seems to be quite irrelevant, though decidedly brilliant talk. Mr. Cox has known many of the most interesting people of the last twenty years, and has a great fund of unusual anecdotes about them. When he begins to tell stories of

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Whitman and Beecher, of William Hunt and Richardson, of Amélie Rives and Duse, it is only an unusually dull and preoccupied mood which will prevent one from becoming interested. The quaint and original expressions; the unconventional opinions; the odd personal observations; the contempt for shams, surprise and arouse the subject. Before he is aware, he too, is talking animatedly. Mr. Cox tells with appreciation how Bishop Taylor, the great African missionary, came to him to be photographed. He was for some time indifferent and dull, not understanding at all what the artist was after, but finally thawed out, and Mr. Cox caught one of his best portraits just as the aged Bishop finished telling with great gusto the story of a young man coming to the ship to see him off on a recent voyage.

"Good-by, dear Bishop," he blubbered; "I shall probably never see you again."

"No," said the Bishop, "you may be dead when I get back."

It is not only the habitual mask of a face which must be conquered. Many people suffer from what is called "camera fear." In front of the machine they become, in spite of themselves, rigid and lifeless. Cox believes that this peculiar feeling is best conquered by taking the subject in his own home or place of work. There he naturally wears a lighter mask and falls more readily into characteristic attitudes. Many of Mr. Cox's happiest results



From McClure's Magazine. C. C. Cox, Photographer.

HENRY WARD BEECHER

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have been obtained by studying his subjects in their own homes. Thus the fine portrait of Richardson was taken in the architect's house. His recent experiences in photographing Mr. Cleveland at the White House, and Major McKinley at Canton, have been equally convincing that if one wishes to make a real portrait it get several characteristic pictures. What could be more characteristic, fuller of sweetness and truth than his portrait of Whitman? He has given us in it what must remain the typical portrait of Whitman—a portrait which is the foundation of Johnson's great etching, which George Barnard, the sculptor, declares has been



From McClure's Magazine. WALTER SHIRLAW G. C. Cox, Photographer.

is wiser to study the subject where he is most at home.

In taking photographs Mr. Cox aims to make as many as six negatives. A complete series of his pictures runs the gamut of a man's soul from the moment of smiling ease to the one of anguish. Not that he always succeeds in completing the series; he rarely fails, however, to his inspiration, and at the sight of which Duse cried out, when it was shown to her, "But it is his soul! *How can one photograph a soul?*"

It is not to be supposed that all of Cox's sitters yield themselves unrestingly to his unusual procedure. Trained to pose to a camera, many are inclined to resent the artist's effort to interest them and make them forget the object

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"IN THE FEN COUNTRY." REV. A. H. BLAKE.

of their visit. There are others who insist that unless a face is lighted in a certain way, the result cannot be satisfactory—slaves of a theory, they fail to see that this is a revolutionist regardless of conventions, whose only aim is to get the fine thing he sees.

Another difficulty with which Mr. Cox struggles is the almost universal notion that a portrait should be something decorative. Many a woman who goes to him makes a really characteristic picture impossible by her elaborate preparations. Nothing could be more fatal to the Cox idea. Chiffons are as inappropriate in one of his portraits as trefoils on a Grecian façade. Where a woman dressed especially for her picture all that Cox can get is, as he says, "a picture of her consciousness of her clothes."

Where the decorative is entirely eschewed, it follows that the subject must have individuality for the picture to be of value. Cox rejoices in the decided character, and shrinks with dismay from a neutral one; there is nothing for him to get hold of. The people who have sat to him have been a rare lot; in the past twenty years he has photographed Walt Whitman, Richardson, General Sherman, C. A. Dana, Melchers, Howells, Hunt, Beecher, E. E. Hale, Duse, and hosts of others. In most of the cases the portraits he has made will remain the standard ones of their several subjects.

The Cox portrait, however, appeals primarily to the discerning mind and the artist's eye. Ordinarily it clashes too hard with the conventional idea of a photograph. The unusual is to many the unmeaning. It is this fact that comes in frequently to depress and discourage the artist. Often he hesitates to seize with his camera what he sees in a face, because conscious that it will not be understood. He shrinks from putting before subjects something which means a great deal to him but will mean nothing them. The real reward in his work lies in his ability to produce that which is an inspiration to those who, like himself, are seeking independently to do sincere, truthful work, rich in a value of its own.

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AN INTERVIEW WITH LAFAY ETTE.

THE name of Lafayette the photographer is known throughout the world. In his studio in Dublin he photographed every notable person who came to him. At the present day he has studios in several of the important cities of England and Scotland. The following account of an interview is given by Levin Carnac in *Pearson's Magazine*, a bright, entertaining English monthly:

"Twenty years ago photography was merely a trade, a system of soulless and mechanical reproduction, which had about as much art in it as sign-painting. To-day it is one of the most exquisite and delicate of the fine arts, and it is only just to say that a large share of the credit of this development belongs to the artist whose classic French name is familiar wherever photography at its best is known.



"CEDARS" BY H. TROTH

"In Mr. Lafayette's hands the camera has became the interpreter of an art. Sittings have become studies, and portraits pictures. This, at any rate, was the impression that I brought away with me after a visit to his headquarters in Westmoreland Street, Dublin, during which he was good enough to lay bare the secrets of his art and mystery before me for the benefit of the readers of *Pearson's Magazine*, and I think I have given ocular demonstration in these pages that the impression was a fairly correct one.

"The rooms form a gallery of fair women, and the general effect on the mind of the mere man is just a trifle bewildering. The eye wanders from picture to picture, from one lovely face and daintly draped form to another; his moral anchors begin to drag, and he finds himself drifting into a disturbing sympathy with the hymeneal and paradisaical ideas of the unspeakable Turk.

"This, however, is a digression that leads somewhat discursively to the interesting fact that it has been Mr. Lafayette's blissful lot to photograph more of the most beautiful and distinguished women of Europe, than anyone else. And which is the most beautiful of them all? Well, he has his opinion. but it was given to me in confidence, and wild motor cars shall not drag it from me.

"That special branch of photographic art, to the development of which Mr. Lafayette chiefly devotes himself, may be briefly described as a happy blend of portrait and picture. For instance 'The Opera Box'—the first and more apposite title of which, 'The World, the Flesh, and the Devil,' is allegorically expressed on the front of the box—contains the portraits of three of the prettiest women in Ireland. The portraits are exact and taken from life just as the subjects sit.

"Yet they are something more, and it is just this something that the photographic artist, as distinguished from the mere skilled operator, comes in. It is not merely a matter of posing a group in front of a camera and snapping the

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STUDY BY C. PUYO

shutter. The inventor of the Art-Study was an artist before he was a photographer. If he had not been he would only be a photographer now.

"In the days of his youth—not very far past—he studied art in France and Germany. In the course of his studies he made a discovery which it needed a clear head and a strong mind to recognize and act upon. He found that the gods had denied him that supreme gift of genius without which excellence is impossible. He declined to be anything but excellent, forsook the palette and easel for the camera and the sensitive-plate, wedded his old art with his new science, and the result was a new art, in which it may fairly be said that he has attained to something more than excellence.

"But even wedded Art and Science do not suffice to the production of the Art-Study in its highest form. Ingenuity which amounts to actual inventive genius is also necessary. Take, for instance, the beautiful study which forms the frontispiece of this number of the magazine. It is a picture, but painted by no human hand. Those two angel-forms floating in mid-air beyond the clouds are the forms of real women, and they were photographed exactly as they are in the picture.

"How is it done? When the prototype of the art study, 'An Evening Zephyr,' was exhibited as a photograph from life, all the photographic world wondered how such a miracle of illusion had been accomplished. No one guessed the secret, but I have permission to tell it here.

"The model is not standing or flying, or suspended by wire or anything of that kind. She is lying down in proper posture on a huge sheet of clear plate glass. Under this is the painted background, so adjusted and illuminated as to give the proper idea of perspective. The draperies are arranged with infinite care on the surface of the glass exactly in the position that they would occupy if they were flying through the air.

"It was this effect of floating that everybody else had tried and failed to get before Mr. Lafayette's happy thought struck him. The plate of glass is inclined at a suitable angle to the background; the camera is poised aloft in the roof of the studio, and tilted so that the focus line of the lens is exactly at right angles to the glass, and a squeeze of the pneumatic

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BARNUM'S CIRCUS—THE GREAT EQUESTRIENNE ACT
BY R. E. M. BAIN

ball which operates the shutter, does the rest in a fraction of a second. Of course it all looks very easy now that you know how it is done, but to know how in the first place was probably a very different matter.

"Another example of Mr. Lafayette's inventive genius is 'In the Arbour.' Here the figure is seen, as it were, in the midst of a flowery arbour. You can see it through the flowers and creepers, not standing against them. The chief factor in the illusion here is again the glass plate, only now it is placed vertically in front of the subject. The foreground is painted upon it, and the subject, posed before a suitable background, is photographed through the glass. This invention, which has been patented, brought to light the interesting and important fact that subjects photographed through clear glass make much softer and more artistic negatives than those taken through air only.

"This naturally brings me to another of Mr. Lafayette's happy thoughts. The greatest enemy that a photographer has is fog. The electric reflector has made him independent of daylight. It will add brightness to a dull day and turn night into day, but in a fog it is worse than useless, for the white rays are just soaked up, and the result is not light, but only a luminous mist which plays the weirdest tricks with the sensitive plate.

"'My finest establishment,' the creator of the Art-Study said to me when he was explaining his conquest of the fog demon, 'is at Glasgow. I put it there because Glasgow is one of the foggiest cities in the three kingdoms. I have beaten the fog there, and I am coming to London to do the same with the thickest variety of atmospheric pea-soup that you can find me.'

"And then, for about the twentieth time, I put the question: 'How do you *do* it?'

"'It's very simple: not altogether original, but an adaptation of a device invented by a German engineer. You see, the atmosphere is a sort of sponge; it takes up a lot of moisture. The moisture holds particles of free carbon, dust, and other opaque substances, and the reason why the electric light is no use in fog is that the sides of these particles break up the rays, and reflect them in all directions.

"'The result is not a light, but only an illuminated fog. Now, if you can't keep the fog out of your studio, and dry the air inside it, these solid bodies will be precipitated in the form of dust, and your fog will vanish. Do you see?"

"My own mental haze with reference to the subject vanished at the same time, and I saw.

"'In short, you create an artificial atmosphere something like what one finds in such countries as South Africa and the rainless regions of South America, which are notoriously the finest in the world for photography?'

"'Just so. I have a hermetically sealed studio full of tropical atmosphere, and in that atmosphere I can take just as good photographs as I could in South Africa or South America or Italy, however thick the fog might be outside. If any of it got in, my hot-air apparatus would instantly dry it, and it would vanish like steam from the funnel of a locomotive.'

"A man who has photographed most of the beautiful women and nearly all the distinguished personages in Europe, might be expected to be fairly full of interesting reminiscence. Mr. Lafayette would not disappoint such an expectation, but of course personal recollections would scarcely be in place here.



THE BERRY PICKERS BY THOS. HINDLE

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At the same time I could not resist asking him just a few questions when we had got through with the art and mystery of his delightful profession.

"'Who are the best sitters you have ever operate upon?'

"'The Royalties, by far. You would be surprised if you knew the trouble that they will take, and the quickness they display in helping you through. The best subject I ever had was Her Majesty. The next was the Princess of Wales. You see, there is the Jubilee portrait of the Queen, and there is the Princess in her robes as a Doctor of Music. I thought myself very lucky, I can tell you, when she allowed me to take that. That was my greatest success. I think, take it all in all, that that is the most popular photograph ever produced. I had to multiply the negative by hundreds to keep anything like pace with the demand. Something like 60,000 copies of it have been sold.'

"'Well, now, and who's your worst subject?'

"'Come here and I'll show you.'

"He took me into another part of the reception room and pulled out a big reproduction of the German Emperor.

"'There, that is the worst photograph I ever took in my life, and a nice job I had to get it. You would'nt think it, but the Kaiser simply hates being photographed. I hunted him for days before I could get within range of him, and, if it had'nt been for the Duke of Connaught, I should never have got him.'

"'It was a regular case of ambush. That picture was taken at Buckingham Palace one Sunday morning. While the Royalties were at chapel, I fixed up my apparatus in a room which the Emperor would have to pass through on coming from chapel. In fact, the Duke promised me that he would bring him in without telling him what was going to happen, and he walked into the trap without a suspicion.'



A NOVEMBER SUNSET BY F. B. HODGES



DUCKS ON THE MARSH BY F. B. HODGES

"'I should have thought His Majesty was about as fond of posing before a camera as he is of posturing before the public gaze of Europe. How did he take it when he found himself in the ambuscade?'

"'He took it very nicely. He turned to the Duke of Connaught, and laughed and said something about "commission." Then he posed. You see what a splendid pose it is. That's German drill and discipline. Still it is not satisfactory. In fact, from the artistic point of view, no photographs of Royalties are as they might be'

"'How is that?'

"'Simply because they won't come to a proper studio to be photographed. You have to go to them just when they please and take them, whether the light is good or bad, and whether the surroundings are suitable or not.

"'I was in a terrible fright the day that I took that last portrait of the Prince of Wales. I was sent for to Marlborough House to be there at four o'clock in the afternoon. At half-past three there was a heavy thunder storm. Of course I had no electric reflector or anything of that kind. I was absolutely dependent upon natural light, and, you know, to make a failure of a Royal portrait is a serious matter. I was almost in despair, and then, about ten minutes before the sitting was to take place, the clouds broke, the sun came out, and the light was almost perfect.'

"'And, after the Royalties, which subjects do you prefer?'

"'Well, some of the great ladies of the land are perfect as sitters, some anything but. On

the whole, however, people on the stage make the best subjects both for ordinary photographs and art studies. They know how to dress, they know how to pose, and—they'll come to the studio.

That's where they have the pull over the Royalties. If I could take a few kings and queens and princesses as I take them, they would be delighted with the result, and I should make my fortune.'

"'Make it?'

"'Well, comparatively, of course. All the same I admit I have a certain amount of reason to be thankful for the push of poverty which drove me into working for my living in a Berlin photographic studio, when my father stopped supplies because I recognized that the gods had not given me the genius which makes a great painter.'

"There is one other point which ought to be noticed if only for the sake of completeness. A picture, whether from the life or otherwise, is nothing without its background. Mr. Lafayette's foregrounds are, for the most part, actually the objects represented.

The backgrounds he paints himself. Above his studios in Dublin, he has a room under the roof, which is just a scene painter's studio, and here you may see backgrounds of various studies to come in all stages of progress. Everything is of course painted life-size, or at least to match the life-subjects which will be posed before it.

"Here again the art of the craft comes in. The size permits of bold and broad effects, long stretches of perspective, and a nice blending of proportions, after which the subtle magic of the camera reproduces foreground, subject and background blended together in a picture as harmonious and homogenous as though it had been photographed from the actual scene depicted.

"Mr. Lafayette is at present studying an application of this to what we may, perhaps, call fashionable photography, but this is a matter upon which it would be both premature and unfair to enlarge.

I only feel justified in saying that, from what I saw of its initial stages, I should be inclined to prophesy a conspicuous social success for it, especially in that department of the art which is intimately connected with presentations at court."

One of Lafayette's superb little genre studies appeared in our March issue.

ON FINDING THE PICTURE. BY H. C. SHELLEY.

How many amateurs there are who, after having actually secured a picture on a negative, cannot find it! When Uranus was added to the knowledge of men, the trained instinct of the astronomer asserted that there was still another discovery to make in the solar system; another planet must be there, although unseen. Given Uranus, the negative in hand, how shall the amateur find Neptune, the picture which only awaits discovery?

A friend of mine once brought me for examination a large collection of negatives in the hope that some among them might contain pictures up to exhibition level. He had traveled far afield in foreign lands, and here and there among his spoils there were several good possibilities. But he did not see them. Although he had found Uranus, his artistic instinct had not been trained sufficiently to convince him that a Neptune was not far off.

The first step in an endeavor to train that instinct consisted in an insistence on the photographic axiom that in many cases the half is greater than the whole. Here was a single figure, which, isolated from its surroundings, leaped at once into the realm of the pictorial; there a boat, which shown as an upright panel and shorn of meaningless accessories, transferred itself from the topographical to the artistic. Even though one has secured a technically excellent 12 by 10 negative, it does not follow that it is necessary to exhibit a hundred and twenty square inches of print. But this is a lesson only slowly learned; most amateurs regard even the rebate edge in a miserly spirit.

In the majority of cases it is quarter-plate or half-plate negatives that the amateur deals with primarily, and in such circumstances it will help greatly towards the discovery of the picture if an enlargement up to say 12 by 10 be made. A preliminary trial may be attempted on the ground glass of the enlarging camera, or lantern slides may be made and the enlarged picture carefully studied when it is thrown on the screen. When a few promising negatives have been selected, bromide enlargements should be taken from them and submitted to prolonged scrutiny. The enlarged transcript will accentuate the weak and strong parts of the picture alike. Now, too, is the opportunity offered of discovering which part of the print is greater than the whole. Perhaps one of the best aids

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in that work consists of a couple of pieces of dark-tinted cardboard cut to the shape of the letter L, with a width of two or three inches. These should, of course, be long enough to cover the 12 by 10 enlargement, and their use is to frame off roughly any one portion of the print. As they are moved from place to place over the picture, now embracing a mere narrow strip oblong or upright, anon showing perhaps a square opening, it will be strange if one portion does not assert its artistic qualities more than another.

The picture-maker by photography is shackled by his tools. The idea of elasticity in connection with the sizes of plates and mounts does not dawn upon him until after many days. No artist of the brush and palette is hampered by such conventionalities. Even if he buys his canvas ready stretched on a frame of definite size, he never hesitates to cut it down or add to its area if the scheme of his composition demands entrenchment or expansion. This freedom is his from early days; the photographer only purchases it at great cost. But purchase it he must, if he aspires to the instinct which guides to the discovery of a picture.—*The Amateur Photographer* (English).

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER III.

(Continued from page 279.)

This may be a fitting place to insert a warning against an error born of misunderstanding. It has been said many times that by-and-by photographers will do works of art when they get "soul" into their photographs. Gentlemen, the photograph that is fine in sentiment and decoration and true to illusion can never be *improved upon* any more than can the statue of the Venus of Melos. A perfect work is good for all time, as Mr. Whistler has said. Means are now at the command of photographers to produce the perfect black and white photographic work, though in future increased *facilities* for producing such work may be found by inventors.

And now we will return to the main subject which I shall lay before you in a series of *propositions only*, for psychology has not yet become a science in *the true sense*; psychological work is merely in the working hypothesis stage, though by no means at the worked out hypothesis end.

PROPOSITION I.

That the material universe may be regarded by us as eternal (though varying in aspects) and the fountain-head of all our *sensuous* impressions.

PROPOSITION II.

That accepting the doctrine of evolution the mind has evolved from the merest crude sensations of the amœba to the complex and subtle sensations of the master artists of to-day.

PROPOSITION III.

That in the course of this evolution there arose the sensation and perception of the beautiful,* and this emotion was followed by acts intended for ornamentation of their persons or homes.

PROPOSITION IV.

That from this germ developed the sense of the beautiful until in civilized man this appreciation of the beautiful may be divided into three steps:—

1. That of sensation.
2. That of perception (intellectual).
3. That of emotion.

That these three be three distinct processes, yet are they one—indissoluble.

PROPOSITION V.

That the appreciation of the beautiful is thus *subjective*, an ideal existing in the minds of men in varying degrees of development; and that though Nature (by which the objective world is meant) has probably produced at various times exquisite harmonies, it took man to recognize these as beautiful, and so it has been said the artist is the master of Nature.

PROPOSITION VI.

That as the NERVOUS system developed, these appreciations became more delicate and subtle, and so a man with a naturally delicate sense of vision gradually purges himself of the coarser emotions, and his perceptions are more purely cerebral acts. A master artist regards first of all by mere *acquaintance* the decorative harmony of a picture or natural scene, *then* by previously acquired knowledge he *knows* why it is lovely, fit, true in sentiment, and *distingué*, and that knowledge gives way to the emotion of joy, which is expressed physically by his smiling face.

That the *reverse* is the process with the Phil-

* According to Darwin this is first noticeable in birds.

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istine; the crude and tawdry appeals first to his emotion, hence the popularity of the sentimental subject, of the anecdote, of "literature in the flat."

PROPOSITION VII.

That we have physiological proof that men's sensitiveness vary in degrees of fineness, thus a *virtuoso* in flour knows samples grown in different countries by their feel—a *virtuoso* in wine knows a glass of port taken from near the bottom from one taken from the top of a bottle; and the blind Laura Bridgeman knew purely *by touch* the clothes of all the inmates of a workhouse. From which it is self evident that in all persons the boundary of their appreciation is hard drawn; in some cases therefore fatally limited by their very organization. A man whose vision is not delicate can *never see* the delicacies of line, color, and tone patent to a more delicate nervous organization. Such a limited person is forever doomed to be outside the pale of the pictorial art world, as the man with no ear for music is for ever doomed to be an "outsider" in the musical world.



PEASANTS AT WORK BY ALFRED WERNER

PROPOSITION VIII.

That as the sense of beauty is a human ideal, this ideal will vary with individuals and *in* the individual from day to day, nay, from hour to hour. Indeed so complex are the brain processes, and so dependent upon each other, that an artist may begin a picture with one ideal and finish it with quite a different ideal. Indeed, it is one of the great difficulties of the artist to keep steadily to his original ideal throughout the work. A glass of wine, a santonine powder, may completely change his ideal or power of execution. From which it is plain how delicate a thing is a work of art, how thoroughly *personal* is every touch in a work worthy the name of art—what a perfect index of its creator's mind.

PROPOSITION IX.

That the ideal existing in any given brain at any moment is complex, the result of the man's whole previous life up to date; wherefore, this ideal is no mere reflection of Nature, but a result of imagination, or the selection from various ideals or parts of ideals; and thus man may go beyond Nature and conceive things that do not exist in the world—such as the vase, the phonograph.

That fine art is the artistic expression of this ideal by a *personal* method, and that no man is an *artist* who has the ideal and can see the beautiful if he have not the power of execution as well. Art is therefore achievement. By their *results* alone are artists to be judged; as thus a very inferior *technician* may be a very delicate seer of the beautiful, but the world only give him credit for his picture—*his result*—and if that be poor, if his hand cannot express his ideal, he does not rank highly nor often does he get credit as a seer. "Art is therefore with the man," as Mr. Whistler has said.

PROPOSITION X.

That Nature sometimes sings in tune, or succeeds in producings glorious and exquisite harmonies, harmonies fully appreciated by the seers of the beautiful, for many more may appreciate than can depict; hence the rarity of real artists. Whence also a layman may be a far keener seer than most painters; but seer *and* masterly executant is Genius itself.

Again, that the harmonies of Nature are altogether different from the harmonies of art—are dependent on different phenomena, and that Nature and art are different worlds. That Nature sometimes sings in tune Mr. Whistler himself has allowed, but I submit that it is absolutely impossible to reproduce that harmony on a plane surface; it is a thing by itself, a thing apart; though a number of unphilo-

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sophical painters *think* they do reproduce Nature—but they do not. Here is a very simple proof suggested to me by my friend Mr. Havard Thomas, a sculptor. Let the observer look at a distant landscape behind some reed-stalks in the foreground. The reed-stalks in Nature, under certain conditions do not blot out *any* of the background, *we see round them*, and see the *whole* landscape beyond. In art the reed-stalks would always *blot out* part of the background. I think our sense of the third dimension of space or "distance" arose first through this peculiarity of vision. For further and deeper proofs of the utter impossibility of *reproducing* Nature as we see her I must refer you to Prof. Helmholtz's *Scientific Lectures*, to Mr. Rood's *Chromatics*, and to our *Perspective Drawing and Vision*. A careful study of these publications aided by a few experiments made for himself will convince the veriest neophyte that it is *impossible* to reproduce Nature or make a "mere transcript."



A MISTY AFTERNOON BY LESLIE SELBY

Proposition XI.

That in photography we are confronted with a new phenomenon, in that we find some of the results of a *machine* give true pleasure to master artists, which has never hitherto been the case with machine-made works.

Proposition XII.

That photography is not art, because a machine comes between the man's ideal and Nature, and the result is *machine-made*; the trapping of a sunbeam. Say the photographer, like the painter, goes to Nature with certain ideals—we will for illustration's sake assume that two men have exactly similar ideals of the beautiful (which is of course impossible). They go together to Nature, and find a beautiful natural harmony in a lovely stretch of purple sands by the sounding sea. The photographer at once sets up his machine, focuses and exposes; but in these very processes *his* ideal has *gone*. What results *may* be beautiful, but it is no more the representation of his ideal, the vision he first saw. It is something else, for the machine imposes certain conditions which were never in the photographer's mind at all. How often has the most experienced of us been disappointed with the photograph of what was fine in Nature—fine to our eyes that is, and sometimes *vice versa?*

The painter, on the other hand, begins, and if he be an expert each touch helps to his desired or ideal end; this wavelet is delicately put in, that breaker strongly and broadly, and so on; everything is done unto one end, and all is certain from the first — whereas the photographer has boxed a maimed and contracted reflection of what he saw. True, it may be a beautiful reflection, but after all it is *Nature's drawing*, and not the man's. Still, such machine-drawn pictures may in certain cases satisfy, or rather harmonize, with the photographer's ideal of beauty, or indeed with the master painter's, as does a beautiful natural landscape; and yet again the beautiful photograph is not *art* any more than the natural scene of which it is a reflection.

Proposition XIII.

That though the machine draws the photograph, yet in the production of a photograph there are a few (very few) very limited *incalculable* elements, as there are in organ grinding and engine driving.

These are—

(1) Selection of view.
(2) " lens.
(3) " focus.
(4) " time of exposure (under, correct, or over), developer, and development curve.
(5) " printing method.

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These limited incalculable elements give a man a very limited opportunity of blending his materials to his ideal, and though by taking advantage of these *with knowledge* he may surpass other photographers in decorative work, still they are too limited for him to express to any degree of certainty or fullness *his ideal*, and since the drawing is mechanical, these few very limited incalculable elements cannot enable a man to express his ideal in anything like the same degree as does a personal art. Indeed photography is not nearly so *personal* an art as sailing or rifle shooting, both of which have very little of the mechanical about them and much of the personal.

In photography man puts the machine under certain physical conditions, and the machine will always (under these same conditions) bring about the same result, therefore the process is logically mechanical. On the other hand, a personal art is one in which the results would differ again and again under the same physical conditions, for the *mind* would work differently on each so-called "replica" of the original—*no artist could paint two pictures exactly alike*. A photographer might take fifty views of a subject exactly similar, from which it is self-evident that photographs are not works of art in the sense accepted by artists, though photography may be an art or craft in the old sense of the word art, as surgery is an art; but such a use of the word "art" as applied to photography would not satisfy the *dilettante*, for the word so used would include *every* photographer as an artist, which is not what the ambitious mean at all.

PROPOSITION XIV.

That therefore it would be wiser for all photographers to drop the use of the words "art" and "artist" in connection with photography (photography is a science or hopes to be some day)—and classify exhibition works as—

(1) Pictorial (when the *intention* is merely and purely to produce a beautiful thing).

(2) Scientific (accurate mathematical reflections).

By using the terms "pictorial photographs" and "scientific photographs" we should, I think, allay all opposition from artists—not to say painters, and critics (who are right in refusing to call photographs works of art), and should be at the same time working in a less pretentious way and in a legitimate pursuit, humble as compared with painting, 'tis true, though the best results surpass all but the masterpieces of art in beauty. And I would suggest that this Society sets the example at their forthcoming Exhibition, and describes the works submitted into two classes, scientific and "pictorial"; for works should be classed according to their intention.

PROPOSITION XV.

The pictorial photographs are worth doing (if well done) because they give us certain beautiful qualities art cannot give, hence their *raison d'être*. That the producers of such may prove themselves as keen seers (not artists) of the beautiful as the master artists themselves, They may have art-knowledge too, yet if they be no creators by personal method I submit they are not "artists." But then this does not mean, on the other hand, that mediocre draughtsmen whose vision is vulgar or obtuse are to patronize seeing photographers, for such mediocrities are not "artists," and indeed, seeing photographers have far more claim to the title, as the masters would allow.

PROPOSITION XVI.

That though photographs are sometimes more beautiful than art, they never equal Nature when she sings in tune. Indeed, I submit that when Nature "sings in harmony" she is more beautiful than photography or art: unrivaled in her delicacy, fineness, and distinction.

PROPOSITION XVII.

That "idealism" and "impressionism," if used in connection with photography, are mere contradictions of terms, and used by slovens in thought—or worse.

Gentlemen, let us conspire *not* to be called by any false or vain names such as "artists," but to produce beautiful pictorial work, each of us in his own way. Let us in friendly and unselfish spirit band together for the furtherance of this end, and let the too eager or ambitious (I will not say vain) neophyte remember that the proof of his delicacy of vision is in a measure what he shows us *of his own*, and that as there are few Laura Bridgemans with perfect touch, so there are few seers of the most delicate beauties, because few organisms have delicate vision. Let the neophyte remember that physiology proves that most are for ever fatally limited to remain *without*, and no disgrace either, if such

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From the Photo-Color Magazine "**BIRDS.**"—Nature Study Pub. Co., Chicago.

FLICKER.
¾ Life-size.

Chicago Colortype Co., Engravers and Printers.

have but the honesty and pluck to own it; the disgrace is pretentiousness and imposture: in *pretending* to see.

Amongst these blind have been the vast body of persons who have ridiculed Mr. Whistler, indeed nearly the whole press has ridiculed him; and yet, gentlemen, to-day his pictures hang in the most honorable position in Paris, the city at present the Queen of the Arts, and so it will always be, for I for one believe that truth is great, and will in the end prevail over obtuseness and dishonesty.

As for these propositions, I do not intend to fight over them, for they are *propositions*, and therefore no fighting matter, but provisional until psychology shall either prove or disprove them.

End of Book I.

Gleanings.

Art is the application of knowledge for certain ends; but art is raised to *fine art* when man so applies this knowledge that he affects the intellect through the senses, and so produces æsthetic pleasure in us; and the man so raising an art into a fine art is an *artist*.—P. H. Emerson.

The photographer has not, it is true, the power an artist has in this direction (art impressionism). His tools are different, he works in a different medium, there is not the same full scope for his imagination, but he has a far greater art-power than it is commonly said he has. In some respects he has advantages which the artist has not. His colors are not only mixed for him, but are also supplied by science. The purely mechanical work which occupies so large a proportion of the painter's time, in his case occupies but very little time. While the painter is laboriously and thoughtfully perfecting one picture, the photographer can turn out scores. But of that which is intellectual, that which is higher, greater and grander, as an element of success than all mechanical and technical conditions put together, may command a fairly good share, if he will only study his calling in a serious, earnest way, and not lightly as if its art possibilities were of subordinate interest and importance.—A. H. Wall.

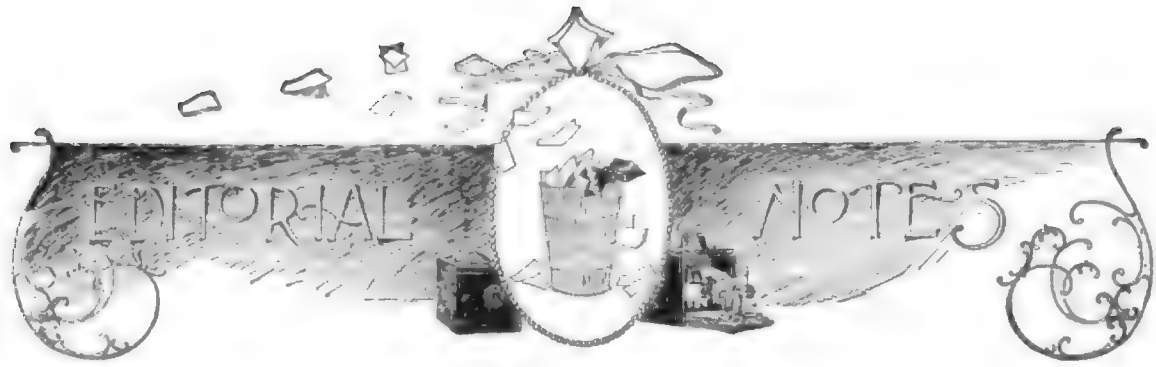
A pretty clean-skinned girl, fully lighted, put before a camera will, as a rule, produce a pretty picture, and the deeply-furrowed face with long shaggy hair of an octogenarian will mostly produce what people call an artistic head. But that is almost as little credit to the operator as Niagara is to the Yankees—it is there, and they can't help it. Art has its seat in the brain, although we only become cognizant of it through the manipulation, and I care not how pleasing the result of a manipulation may be; if it is not intentionally and willfully produced it is not art.—J. S. Bergheim.



BENEATH THE RUGGED ELMS BY GEO. W. NORRIS

The smudger who throws his paint about in the hope that something will come of it is no artist.

I don't say that every conception carefully recorded is artistic, but I say there is no art in recording something of which one had no conception.—J. S. Bergheim.



We are busily engaged in the preparation of The American Annual of Photography for 1898, and shall be pleased to receive pictures and short articles on practical subjects from our readers. It will be our endeavor to make the 1898 volume eclipse all its predecessors.

* * * * *

Vacationist writes: "I feel constrained to write to The Times; for I learn that if I take my American plates outside of our frontier, expose them, and then develop them (as one does to see if good enough negatives be assured) before I have returned to the "land of the free," a duty of 35 per cent. is enforced. Is this the fact and are American made plates taken away with one and exposed in Canada, Europe, Africa, or other "foreign parts" dutiable on returning, even if not developed abroad? Please kindly to enlighten us on these points. Are high-class photographs dutiable if brought to this country by returning tourists?" We believe that upon proper representation to the authorities no duty will be charged upon plates of American manufacture. We, however, remember the case of a lady amateur who exposed some hundreds of American plates in Europe. On returning she was charged a large sum for duty on the grounds that although the plates were of American manufacture, they had been "improved" abroad. The matter was taken to court and we believe the case was won by the clever remarks of the lady's counsel who argued that it was very doubtful whether plates exposed by amateur photographers were "improved," thereby. No one could prove that they had been, so the money paid was refunded.

* * * * *

We think that everyone who has studied the work of the best English photographers or visited any of the Salon or R. P. S. exhibitions will admit that they succeed in obtaining far more artistic effects than the photographers of this country. Why is this? Is it because they possess more artistic feeling or is it because the conditions, climatic and otherwise, are more favorable for the purpose? It has been stated that these effects are more or less accidental. Is this so? We think not. Some years ago we were in company with some fellows who could all handle a gun. They were trying some difficult shots A slit had been made in a wooden board and a dime inserted. At a fairly good distance each man was trying to hit the edge of the coin. None of them was far from the mark, but there presently entered a man unknown to them all, who after a good deal of joking upon their want of skill picked up a gun and fired—hitting the coin exactly on its edge. Our friends all crowded round him and he was the hero of the hour. He was pressed to try some still more difficult shots but he steadfastly refused. He was satisfied with the reputation he had made for himself. When we became better acquainted he admitted that he had never handled a gun before in his life and when he fired had closed his eyes.

In the same manner it must be admitted that there are a few photographers who have made a reputation for themselves with some picture, the effect of which was obtained by purely accidental means. But these are few and far between, and their reputation must of necessity be of an ephemeral nature. The man who makes a name in the photographic world to-day must be able to uphold it.

* * * * *

The following amusing story is told in one of the dailies: As examination time approaches, the faculty of Hamilton College finds itself confronted by an embarassing situation, viz.: What is to be done about the examination in Photography? Last year the faculty decided that there should be an examination in this subject, and an examination there was, but of such a nature that they do not feel any desire for a repetition of it. Photography is an elective study, included in the general branch of

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physics, and is taught by Prof. Samuel J. Saunders. Prof. Saunders is a gentleman who pursues the even tenor of his way according to his own notions, without bothering much as to the views of other persons, in what he considers his own concerns. The course in photography he regards as peculiarly his own concern. Therefore, at the end of the course last year he gave notice to the class that all had done well and there would be no examination.

This came to the ears of the rest of the faculty. It was brought up in faculty meeting. Conservatism is a strong point of the Hamilton College faculty.

"What! No examination in Photography?" they exclaimed. "This is most subversive. It sets a bad examble. There must be an examination in photography.

And they so voted.

"Very well," said Prof. Saunders: "An examination in photography there shall be. I'll make out the papers.

Accordingly the papers were made out and duly printed like all the other examination papers. The class in photography assembled in fear and trembling to find itself confronted with three questions, as follows:

1. How many photographs have you taken during the term?

2. Do you like photography?

3. Would you take a photograph with a camera or a telescope?

The entire class passed. The average standing for the examination was 100 per cent. That is why the faculty, unwilling to back down from the position it has taken, is busily trying to decide upon an adequate form of examination in that subject. Meanwhile Prof. Saunder's class in photography flourishes undismayed.

* * * * *

In the table of exposures contained in Mr. W. H. Walmsley's article in our last issue a serious error occurred. The table should read as follows:

Diffused daylight, bright and clear....1 second or less
Acetylene gas, 1 ft. burner, 7 in. distant, 3 seconds
City gas, 6 ft burner, 7 in. distant, ...3 minutes
Coal oil lamp, 1 in. wick, 7 in. distant, .4½ minutes.

* * * * *

In a letter to the editor Mr. R. D. O. Smith says:

"Having been in daily intercourse with officials of the patent office for nearly thirty years, I never fail to accept a gauntlet like that thrown down on page 244, Photographic Times for May. It has seldom been my fortune to see more error in so few lines. While it need not be expected to find a foreign correspondent well versed in our patent system, it ought not to be too much to expect a prominent American journal to be better versed in the most valuable of all our administrative departments. Possibly you will think that too strong, but it is not There is no single bureau of our whole government which has proved to be of benefit to the people of the United States comparable to the benefits bestowed by the Patent office. In 1836, when the present system was adopted, the United States was essentially an agricultural country. There were few manufactures, and none of great importance. To-day we are the first manufacturing country of the world. Not only has the name Yankee become synomous with *ingenuity* the world over, but it has been well earned. Our manufactures have made us the richest nation in the world. Our inventors have made our manufacturers and our patent law and patent office has made us a nation of inventors. Without the multitudinous inventions produced and put in practice by our inventors, our manufacturers would be unable to pay more for every material, and more for every hour's labor than is paid anywhere else in the world, and yet make the goods produced so cheap that American products can be sold in every other country. There is not a product of our factories which is not sold in competition in the homes of our competitors. So meritorious are our goods that Germany is flooded with German-made imitations marked with American names. England is not much better. The wooden pulleys made by the writer's company are carried to far off forest-clad Russia, and these are both cheaper and better than imitation pulleys made in Germany.

These are simply cold facts which any man with eyes may know. There is no special gift of invention in the brains of Americans. Men of all other nations prove just as fertile when they come to our shores. The secret is simple. Our patent system gives the "poor" inventor a chance, and it is just as good a chance as that of the rich one.

Now that which produces such results as these is not to be turned down with a sneer. That which "gets there," as does the patent office is "all right," even if it does not have the approval of would-be world regulators.

A patent in this country costs about the same

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as a patent in England, but the inventor gets much more for his money. Until England abandoned its sixteenth century system a few years ago, and made a larger advance toward our system than could have been expected, the English patent cost about 7 times more than it costs here. In the American patent examination the applicant gets the benefit of knowing the prior art. England gives him nothing but the patent. The official examination in our patent office cost the applicant $15. An equivalent examination in England, or here either, made by an outsider, would cost $500, or something like that.

The authorities of the United States do not make a pretense of securing the patentee. It gives him a patent good as far as the office can ascertain, but still conditioned upon the truth of the patentee's statements as to matters beyond the knowledge of the patent office. It gives him property in his invention, to stand upon the same footing as all other property. No inventor is so unfortunate as to suppose that the government will or can defend the patent. That folly is reserved for people who never made inventions.

The men entrusted with the duty of examining applications are experts, and are provided with every means of facilitating examinations. They take whatever time may be required. They are the farthest imaginable removed from incompetence. To gain admittance to the examining corps and to the lowest places in it, requires a most thorough educational preparation, and every promotion requires the successful passage of a further searching examination. To reach the grade of Principal examiner (in charge of a class) requires four promotions. The examiners are not shifted to-day or to-morrow, but are only changed for strong reasons. But a change of class does not produce any such violent consequences as your writer seems to suppose. He carries with him his store of information—his trained perceptions, and has only to familiarize himself with his new materials. Every examination is subject to the scouting of more than one, and is always open to discussion by the inventor or his representative. It will be a slender case which does not develop its merits, if it has any, when the inventor has the assistance of an able solicitor.

The gentleman who wrote the rejoinder to the PHOTOGRAPHIC TIMES correspondent would be benefited by a little visit to the patent office in search of information. Besides he would find it interesting."

Our information was derived from a gentleman who was for some years in the Patent office as examiner. We would be only too pleased to discover that it was incorrect, but unfortunately many instances of gross ignorance on the part of the patent office authorities have come to our personal notice.



OCTOBER MORNING BY FERDINAND COSTE

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MR. FAIRMAN'S EXHIBITION.

Mr. Charles E. Fairman, one of the most prominent amateur photographers of Washington, has been in the habit, for the past three years, of giving an annual exhibition of his work, at his residence in Le Droit Park in that city. The one held during the latter part of April is worthy of more than a passing notice. There have been, during the past year, several of club exhibitions, but it is seldom that an amateur has the industry and courage to put forth a large collection made up entirely of his own work. It may be added that it is seldom one presents a collection which, for general excellence, compares with the one recently exhibited in Le Droit Park.

The prints were displayed in two large rooms, a pretty wall of terra cotta forming an excellent background for the Rembrandt mounts and platinum prints, which prevailed.

It is difficult, among so many pieces of good work to particularize, and it may safely be said that there was not a picture in the entire collection lacking in merit. There were, indeed, many that will long be held in pleasant remembrance by the thousand and more persons whose good fortune it was to attend the exhibition.

One of the most attractive pictures, as you entered the rooms, was a soft and harmonious view entitled "On the quiet Antietam." The meandering stream, now so peaceful, but which proved the scene of one of the greatest battles in history, was hemmed in by a lovely bit of roadway and bending foliage, the effects of light and shade being most successfully rendered. "A Summer Afternoon," (another view on the same creek) needed no title. Around the listless figure on the bank there was a warmth of atmosphere that plainly told of the advent of "refulgent summer, attended by the sultry hours."

"The Fagot-Gatherer," represented a young girl in quaint peasant costume on a sloping field. While the figure is a trifle large for the plate, and the treatment of the subject is not particularly novel, it is one of Mr. Fairman's most successful efforts.

One of the prettiest bits in the exhibition was "A Pair of Rustics," an attractive country maiden and swain, indulging in a little flirtation by an old stone wall. The young woman is seated on the wall while her admirer, his arm resting by her side, is looking up and whispering a tale which is very very old, but ever new. At least that is what he ought to be doing.

"The Silver Question" is apparently a debate in front of a country store. One of the participants is about to read an extract from a city newspaper, and five or six figures are grouped about most naturally. Indeed, it would seem as though in this, and in "The Arrival of the Mail," Mr. Fairman had caught the figures unawares, and just as they were pursuing their daily avocations.

The willowy and graceful figure of a young lady coming down some ivy-embowered steps, with a look of expectancy and disappointment on her face, forms a most attractive picture, and is appropriately named "'He Cometh Not,' she said."

"The Fortune-Teller," represents one of Mr. Fairman's most graceful models posed, à la Robinson, in a Gypsy camp, where a bright horoscope is evidently being revealed to her.

The same model was fittingly chosen for the beautiful picture "Homeward Bound," a Dunkard country lass, with her possessions in a large handkerchief, wending her way along the same quiet Antietam. While Mr. Fairman is to be congratulated on his success as a photographer and artist, I question whether much of the credit does not belong to this charming subject that served also as a model for Mr. Fairman's most popular pictures "The Ferryman's Substitute," "Drifting," "A Drink of Cold Water," "Sunshine," and other equally beautiful pictures displayed in this exhibition. She poses most gracefully and naturally, and is of great help, and incentive to the artist.

While Mr. Fairman has many very attractive landscapes in his collection it is more particularly in Genre work that he excels. His Greek figures, as a rule, are classical, and correctly posed. In this exhibition there was a marked improvement in this respect, the figures themselves, and the draperies and accessories being more artistically handled than in Mr. Fairman's previous work.

"Echo," "In Bondage" and other figures exhibited last year failed to compare in simplicity and sentiment (two of the charms of Greek studies), with "Melancholy," "Autumn," "A Greek Figure" and others, of which want of space prevents an extended notice. The print of "La Penitente," a Guido Reni effect, on the Mater Dolorosa order, attracted considerable attention, and one feels that it justly deserved the medal it received in a foreign exhibition. Indeed quite a number of the prints shown by Mr. Fairman have been similarly honored, although the fact was not so stated. "The Tangled Skein," although taken in the gallery of the Capital Camera Club of this city, looked more like a picture cut out of a frame a hundred years ago. A benign old lady is seated near a New England fireplace, while a boy, presumably her grandson, is aiding in disentangling the skein. All of the accessories are well managed and the composition is most successful.

The same may be said of "Just Landed" which would certainly never be attributed to the studio.

One would rather think that the artist had gone to some dock in a large city, and there found the Flemish peasant girl who is seated on the old fashioned traveling chest, entirely oblivious, apparently, of the camera's presence, and lost in the contemplation of what the future is to open up to her. The picture of "Morning Glories" shows the three-quarter figure of a beautiful girl bearing in her hand a spray of morning glories, quite conventional, you will say; but only look at the sweet face, and the soft and tender tones of the whole picture, and it will ever linger in your memory. There are other figure pieces of this same young lady in Mr. Fairman's collection, the most attractive of which is probably "Ann Hathaway."

On the whole the exhibition was most successful and Washington can congratulate itself on having so painstaking and conscientious an amateur as Mr. Fairman.

LIVING PHOTOGRAPHS.

BY AUSTIN P. NICHOLS, S. B.

During the past year there have been on exhibition, at numerous theaters, instruments bearing various fanciful names, but all based on the same scientific principles and giving practically the same results. Enlarged

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photographs are thrown on a screen, as with an ordinary stereopticon, but with this difference, that the objects represented are all in motion, the same as in nature. The waves are seen rolling in and dashing on the rocks, horses gallop, men walk and run, and railroad trains draw up to a station and stop while the passengers alight and depart with their baggage, exactly as in life, even the varying expressions of their faces being perfectly shown, and there is no limit to the variety of moving scenes which may thus be reproduced except the limitations of the photographic art itself.

These effects are due to a curious physiological law known as the persistence of vision. If any object at which we are looking is suddenly withdrawn from our sight, or if we close our eyes, we do not cease to see it at once, but the image remains for a short time on the retina of the eye, varying in different eyes, but usually from one thirtieth to one fiftieth of a second. This may be easily proved by whirling around the glowing end of a lighted splinter of wood held in the hand. The eye cannot follow the movement, but the images of the spark of fire impressed on the different parts of the retina as it is moved around, unite into one, and a complete circle of fire is seen. Another way to illustrate this principle is by cutting a disk of cardboard, and drawing on one side a picture of a bird, and on the opposite side a cage. If the disk is rapidly rotated before the eye by twisting two threads attached to opposite sides, the image of the cage will persist in the eye until the side on which the bird is drawn comes around, and the bird appears to be inside the cage.

Now to apply this principle to the vitascope photographs, we will take the simple subject of a man walking, and will suppose that he takes one complete step a second. If, during that second we could take, say, twenty-five or mere consecutive photographs of him, we should have a complete series of views showing him in the first one just lifting his foot from the ground, and returning it to the ground in the last. This is exactly what has been accomplished. Photographic films are now made so sensitive that a picture may be taken in a much less time than a twenty-fifth of a second, and, on a flexible transparent ribbon of celluloid, a series of several thousand consecutive views of any moving object may be taken showing the varying changes at intervals of a small fraction of a second during a period of several minutes.

It must also be noted that the ribbon of sensitized celluloid is not simply passed before the camera lens with a uniform movement while the pictures are being taken; this would give only an indistinct blur. The delicacy of the machinery is such that the sensitive film stops before the lens while the picture is being taken, and then moves on a sufficient distance to bring a fresh part into the field of view, the lens being covered by a shutter during the movement of the film, and repeats this twenty-five times a second with perfect accuracy. Practically it is found that the film is stationary for about eleven twelfths of one twenty-fifth, or eleven three-hundredths of a second, while the remaining twelfth of the time, or one three-hundredth of a second, is occupied by the shifting of the film.

After having obtained the strip of pictures, they can be thrown on a screen by a system of lenses in the same way as with an ordinary magic lantern. To give the effect of motion it is only necessary to repeat the process by which they were taken. The strip of pictures is rapidly wound from one spool to another in the lantern, each picture stopping for about a thirtieth of a second, and then passing on and giving place to the next. Owing to the persistence of vision each picture remains upon the eye until it is replaced by the succeeding one, and the illusion of natural motion is perfect. The effect as a whole is beautiful and fascinating beyond description, and no one should lose an opportunity to see such an exhibition.

Although the principle of the persistence of vision has been known for many years and applied to the production of the illusion of moving pictures, the marvelously delicate and accurate machinery necessary to take so many consecutive photographs of actual scenes from life, and project them properly upon a screen, is the product of the past two or three years. The credit of the invention is claimed by several different persons, but it is probable that it belongs to no single inventor, having been perfected by several working independently, but at the same time.

At present there is some room for improvement in the clearness and steadiness of the views as thrown upon the screen, but this is simply a matter of mechanical detail which will doubtless soon be attained, and, in combination with the phonograph the possibilities seem almost endless. Not only scenes and events of historical and world-wide interest, but the very words and tones of the speakers engaged in them, can be recorded and preserved for future generations. Although the vitascope has hitherto been only an amusing toy, it will doubtless in the future prove to be of distinct scientific value, and hold an important place in the education and enlightenment of mankind.

FOIBLES OF THE AMATEUR.

A hobby like photography
 Demands a balanced mind,
A subtle touch, a nerve that's free
 And eyes that are not blind;
Else sundry failings will appear
 That seem both puerile and queer,
And though you ask the 'why,' I fear
 No answer will you find.

* * * * *



"THREE CRONIES" BY F. S. STEDMAN

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Why doth the novice tremble so
 Within the darkened room?
Why doth he hold his breath, as though
 He feared some awful doom?
His fingers like an aspen shake,
 Lest they a masterpiece should break:
You'd think his very life at stake
 So settled is his gloom.

Why such an earnest knitted brow,
 So wanting in repose
That drops of perspiration now
 Come trickling down his nose?
He looks like being very sick,
 (Luck send no slide may catch or stick,
No plate, from being over thick,
 To culminate his woes).

I fear I can't explain the why
 And wherefore of the thing—
The marked distress, the 'hunted eye,'
 The reason taking wing.
Beginners mostly feel the same
 When seeking photographic fame—
A weakness none will surely blame,
 This foible that I sing.

Go question the examinee
 Who has no appetite,
Or ask the budding young M. P.
 His maiden speech in sight,
Limp 'middies' whom the billows mock,
 Raw soldiers in the battle shock,
The débutante in smartest frock—
 Ask any neophyte!

* * * * *

When lovely faces flash in vain
 Across the artist's view,
And all neglected they remain,
 As flowers the prairie strew;
Why lacks he then the nerve—the cheek—
 That nameless quality—to speak,
And claim a sitting once a week,
 To Art a tribute due?

When street, with motley mixed mankind,
 And market-place, are filled,
Where all emotions he may find,
 And human traits, distilled;
Why rests his camera supine,
 When chance and everything combine
To give a snap-shot wondrous fine,
 If so the artist willed?

When heaven and earth with beauty teem
 In moments rich and rare,
When Paradise itself would seem
 To hover in the air;
Why doth the amateur withhold,
 Until the scene is dead and cold,
His hand—instead of being bold
 A picture great to dare?

Ask all who shirk (with bliss in view)
 The oracle to start:
Go, ask the love-sick laggard, who
 Is stung by Cupid's dart,
Why courage oozes drop by drop,
 While dumbly he his brow doth mop,
And ever hesitates to 'pop'
 'The question' of his heart!

* * * * *

Perchance, if these or those you ask,
 An answer may be found
What 'tis that magnifies their task
 And keeps them fetter-bound,
This something wanting in their make,
 This quality they don't partake
That lets them commonsense forsake,
 And all their wits impound.

The lack of this unknown—this x
 ('Tis nerve some people say—
Supposed to mark the sterner sex
 From those of weaker clay)
Keeps amateurs to ruts well-worn,
 Leaves many a work of art unborn
That might photography adorn,
 And drives success away.

—C. S. M., in *The Journal of the Amateur Photographic Society of Madras.*



THE MILKMAID BY DEXTER THURBER, JR.

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NOTES.

The P. A. of A. Convention meets on the 12th of July.

See Particulars of our Postal Card Competition.—They will be found elsewhere.

A Bas-Relief Studio has been opened in San Francisco, Cal.

The London Camera Club has revised its rule under which professional photographers were ineligible for membership.

Have You an Idea, then send it to us in the shape of a short article for the 1898 ANNUAL. Diagrams and pictures to illustrate same will be carefully reproduced.

A Radiograph Society for London has been proposed. Those interested in X-ray work should communicate with Dr. Walsh, 5 Pump Court, Temple, London, E. C., England.

Mamma (examining the proof of her small daughter's photograph): "Grace, why didn't you smile?"

GRACE (aged six years, with an injured air): "I did, mamma, but the man didn't put it down."

M. Carey Lea, who made important researches into the theory of photo-salts, died recently. Although but little known to the younger generation of photographers, Mr. Lea was at one time a most prolific writer for the photographic magazines The early issues of the PHOTOGRAPHIC TIMES contain many contributions from his pen.

The Hartford Public Library, of Hartford, Conn., is desirous of completing its files of this magazine. They require No. 528, Vol. 21; 620 to 639 inclusive, Vol. 23; 537 to 551, inclusive, Vol 22, also title page and index of Vol. 34. They offer 15 cents a number.

The Photographic Club of Baltimore, at the last annual meeting, the following officers and directors were elected to serve for the ensuing year: President; A. S. Murray; Vice-President, Dr. F. Slothower; Treasurer, E. M. Barker; Secretary, P. G. Buck. The above, with Jordan Stabler, James B. McKee, and F. I. McAllister, constitute the Board of Directors.

Postal Card Competition.—The PHOTOGRAPHIC TIMES will be sent free for one year to the writer of the best paragraph containing some useful hint or valuable information to photographers, amateur and professional. Paragraphs must be written on postal cards only. We reserve the right to publish any sent us, whether same gain the prize or not.

Under-Exposed Plates.—In these dark days, under-exposure is generally the rule, and not the exception. The remedy proposed is to develop the plate with a pyro-soda developer until the high-lights appear; then wash well for half a minute, and, finally, complete development with metol. The plan is applicable also to cases in which the correctness of exposure is uncertain, and has for its object the making of a negative strong in the lights and rich in shadow details. Using pyro and metol separately is said to give far better results than either developer would give singly or in combination.—*Photography.*

Two Hundred Thousand Portraits valued at Five Francs.—A somewhat amusing judgment was given in Paris, one day last week, in an action brought against the Prefect of Police, for having illegally seized 200,000 portraits of the Duc d'Orléans. The Court ruled that the seizure had been illegal, and condemned the Prefect to restore the portraits, or pay their equivalent in money. As, however, "they were devoid of any artistic merit, and were of no marketable value," the Court, knowing they had been destroyed, assessed their value at five francs, and also ordered the Prefect to pay the plaintiff one franc as damages. From this it would seem that the value of portraits "devoid of any artistic merit" is appraised very low indeed in Paris. That is not always the case here.—*British Journal of Photography.*

At the Annual Meeting of the Brooklyn Academy of Photography, held June 8th, at their rooms, 177 Montague Street, the following officers were elected to serve for the ensuing year, the twelfth in the history of this organization:

President, H. B. Fullerton; *1st Vice-President*, Samuel Baron; *2d Vice-President*, F. M. Lawrence; *Corresponding Secretary*, W. B. Dudley; *Recording Secretary*, W. Arnold; *Treasurer*, W. T. Wintringham; *Curator and Librarian*, A. F. Ormsbee. *Trustees:* Aug. A. Goubert, Starks W. Lewis, John Merritt, A. R. Pardington, Frank La Manna.

The President-elect is well known as a successful and ardent amateur photographer, an active man of business, and prominent in wheeling circles as an advocate of good roads, being chairman of the roads committee of that association in Brooklyn.

The Academy has for years used the bicycle as a photographic adjunct, and the frequent photo-bike runs to places of interest and beauty have successfully demonstrated the full fitness of the wheel to carry camera plates and camerist to places too far to walk to and abounding in picturesque material.

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Focusing.—The idea of many photographers, some professionals as well as amateurs, is that the proper thing to do always is to get the image or view sharp. But to the scientific worker, and to one who knows something of art as well as of photography, this is by no means an invariable rule. The *Photographisches Notiz-buch* gives a method adopted by one of its readers. In order to made the best of the depth of focus in the lense, the most distant object that is desired to be sharp must be got into focus before all else without using a diaphragm. After this has been secured put in the stop selected as being the proper one to use on the occasion, then observe the point (nearer than the one taken at first) where the sharpness ceases. Then remove the stop and focus this point; again replace the stop and focus this last point; place the stop again in the slot, and the result will be satisfactory. But in photographing portraits the reverse method should be adopted; the nearest object must be first focused, afterwards dealing with those points the most distant.—*Photography.*

Warm-Tone Gold Intensification for Platinotypes.—When a platinotype is weak and a rather warmer tone than that of the normal platinotype print is desired, Mr. Dollond's method may be adopted. The wet print is laid face upwards on a glass plate, and after the excess of moisture has been blotted off, glycerine is spread over the surface with the finger or a Blanchard brush. By mixing a few drops of weak chloride of gold solution, say 1 grain to a drachm with 2 or 3 parts of glycerine, and spreading this over the surface of the print, the image gradually becomes intensified and toned. When a stronger action is desired here and there, a few drops of the chloride of gold solution may be poured on the print and incorporated with the glycerine already on the paper. As soon as sufficiently toned and intensified, both front and back should be freely sponged with water, after which the print should be washed by several soakings. Subsequent treatment with a reducing agent has been recommended, but may be dispensed with.—*The Amateur Photographer* (British).

Theoretical Aspects of Roentgen Rays.—According to *Nature*, Dr. Julius Pretch, of Heidelberg, has just published an important thesis on the cathodic rays, Roentgen rays, and other radaitions emanating from vacuum tubes. Besides the rays capable of being deflected by a magnet, according to the law of Biot and Savart (which the author has verified by photography), Roentgen's, Goldstein's, and Lenard's rays are shown to be distinguishable by their chemical and photographic effects. Dr. Precht considers that a portion of the radiation from a discharged tube is not a wave motion, because the absorption of the rays in passing through paper varies with the time of duration of the radiation. Interference phenomena were obtained with direct and reflected Roentgen rays (a fact which will surprise many, owing to the general belief that Roentgen rays can be neither reflected or refracted). Calculating from these phenomena, their wave-lengths were found to vary between 370×10^{-6} to 830×10^{-6} mm. From the fact that transverse light waves of this length cannot pass through black paper, Dr. Precht is inclined to accept the theory of longitudinal waves. By interference experiments such as these, wave-lengths were obtained from two to four times as great as those found by Voller in observing the diffraction produced through a slit.

Mounting.—The following is given as an effective style, by N. Ley, in the *Photographisches Archiv:* After stripping glazed gelatine-chloride prints from their supports, they are trimmed to the required size. An oval or other suitable shape is cut out of a piece of matt celluloid, and two wooden blocks are prepared, one the shape of the aperture and the other the shape of the mask. The sheet of celluloid is laid upon the back of the print, and the shape of the aperture is traced upon it in pencil. This is then covered with the block of corresponding shape, and the margin of the print pasted. The mount having been previously prepared by pasting upon it a piece of blotting-paper of the size of the print, the pasted print is transferred to the mount, and the second block, with the clear opening, is placed upon it. The print with the block in position is then passed through a press. The surface retains its high glaze in the center, and the margins are matt.—*British Journal of Photography.*

Radiography for All—A Peculiar Optical Illusion.—A correspondent, writing to *The Photographic News*, says—Undoubtedly one of the most interesting discoveries of the past year is that of the Röntgen rays; but, unfortunately, while photographers are specially interested in this subject, it is only those who are the happy possessors of a long purse and an elaborate and expensive set of apparatus who are able by means of the X rays to show their friends how fearfully and wonderfully they are made.

It is perhaps not generally known, however, that, by means of a very simple optical illusion, an almost perfect imitation of the wonders of radiography can be shown to admiring friends, without the trouble and expense of induction coils, tubes, or fluorescent screens. All that is necessary is to take a small feather from a pheasant or turkey, and, holding it close against the eye, look through the radiating ribs at the end of the feather at the fingers of the hand held up towards the sky, or against the window. The flesh of the fingers will then appear to be transparent, with the opaque bone running down the center, just as shown by the true radiography. If it is desired to show it by gas-light, a piece of ground glass must be held in front of the flame to diffuse the light.

I do not attempt to explain this, but, if properly done, the illusion is perfect.

The Annual field day of the Providence Camera Club was held Monday, May 31st.

In spite of heavy clouds and threatening weather, twenty-five enthusiasts made the excursion across the northern part of Rhode Island, from Woonsocket to Pascoag. Leaving Providence by train at 7.45 A. M., a six horse wagon took the party at Woonsocket for a drive along the valley of Branch river, through the picturesque villages of Forestdale, Slatersville, Nasonville, Glendale, and Harrisville, arriving at Pascoag at 1 P. M., where a good dinner was served at the Griffith House. Light rains in the morning prevented much

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photographic work, but the sun broke through the clouds after dinner, and the party scattered in search of pictures. Altogether a goodly number of plates were exposed, and all joined in voting the trip an entire success. Return to Providence was made by train from Pascoag at 5 25 P.M., arriving home at 6.30, after one of the most delightful outings ever held by the club.

A Year of the X-Rays.—Many experiments were made to determine the source from which the rays proceed before it was learned definitely that they emanate from the surface upon which the cathode rays first impinge—a fact that was announced almost simultaneously by several experimenters. It is one of the important points that have been determined, and even this was distinctly intimated by Prof. Röntgen in the twelfth section of his original paper.

In intensity they vary inversely as the square of the distance from their source.

They electrify some bodies positively and some negatively, and whatever charge a body may already have they reduce or change it to the charge which they would independently give to the body. Their penetrating power depends upon the length of time they act.

Thus, gradually, these and many additional isolated facts have been established, and no doubt enough data will be accumulated eventually to permit generalization into laws, but that stage has not yet been reached.

Four theories have been suggested:

1. "They are ether waves, like ordinary light, but of exceedingly brief period, therefore ultra ultra-violet."

2. "They are streams of material particles."

3. "They are vortices of the intermolecular ether, forced from the cathode when the gas pressure is sufficiently low. Rectilinear propagation, absence of reflection, etc., follow from the properties of vortices."

4. "They are variations of stress in the dielectric surrounding the vacuum tubes."

Each of these theories is entitled to the Scotch verdict "Not proven," through the preponderance of opinion is on the side of the first. Still, it can not yet be said to be more than opinion.—Prof. D. W. Hering, in *Appleton's Popular Science Monthly* for March.

Photo Reliefs.—Schmidt suggests the following method for making reliefs by photography: A sheet of glass is coated with bichromated gelatine, which is prepared by allowing fifty parts of gelatine to swell for some hours in water, melting and adding two parts of potassium bichromate dissolved in forty-eight parts of water. The bichromate should be added by lamplight, the gelatine solution being constantly stirred and kept warm meanwhile. The glass should be carefully leveled and warmed, and the gelatine should be poured into the middle of the plate; using a glass rod for it to run down to avoid air bubbles, and the rod may be used to distribute the gelatine if necessary. As much solution as possible should be poured on the glass without allowing it to run over the edge, and, when set, it should be dried in a warm place free from dust, and used as soon as dry, as it will not keep long. It should be printed under the negative until an equally dense negative gives a fully printed-out image on collodio-chloride paper. It is advisable to use direct sunlight, and allow the rays to fall on it as nearly as possible at right angles to the negative, as this ensures greater sharpness. The plate should, after exposure, be well washed in cold water till full relief is obtained, and then placed on one side till surface-dry, and then brushed over with a soft brush with linseed oil, and then a thin cream of plaster of Paris poured on to it and allowed to set. The relief may be readily stripped from the gelatine, and may, of course, be used as a mould for electrolytic deposition of metals.—*British Journal of Photography.*

The 14th Annual Meeting of the Providence Camera Club was held in the rooms of the club, June 1st.

The meeting was called to order by President Fuller.

Mr. F. C. Hodgman was appointed a delegate to attend the Convention of the New England Lantern Slide Exchange to be held at Marblehead, Mass., June 17.

The report of the Room Committee was received and showed that the value of the club's property is estimated at $651 40.

The report of the committee on the annual outing was received and placed on file. The report of the Treasurer, showed a balance of $140.37 in the treasury. The report of the Recording Secretary, showed that the present membership of the club is 45 active and seven associate members.

The club then proceeded to elect officers as follows: President—F. B. Wilbur; Vice-President—W. P. Mather; Recording Secretary—F. E. Leonard; Corresponding Secretary—J. E. Davison; Treasurer Edmund A. Darling; Librarian—C. A. Stoddard; Executive Committee—President, Treasurer, and Secretaries, *ex-officio*, and J. A. Miller, Jr., C. A. Stoddard, F. C. Hodgman, J. H. Tucker, R. C. Fuller. The meeting then adjourned.

Photography and Decency.—A correspondent writes to the *Bristol Times and Mirror* of February 3: "The Photographic Exhibition has just closed. All who have visited it must have been struck by the remarkable advance of the science, and must have observed its high capabilities, in refined and intelligent hands, of true artistic treatment. It distinctly showed that the mind of the photographer, like the mind of the painter, is an important factor in the work he produces. It is in the mind of the photographer to lift most of his subjects to a high level, or degrade them to the vulgar realism that disgraces much of our periodical literature and much of our cheap pictorial art. It is, therefore, no mere prudery to say that many of our shop windows present very good signs of very bad taste when the principal attraction is the photograph of the voluptuous form of some popular actress, the line of whose figure is covered, but certainly not concealed. It seems to me, sir, a matter at least for regret when so very many earnest endeavors are made through our various educational systems to elevate the public taste, that such a beautiful art should be prostituted to low purposes. It is to be deplored that women can be found willing to submit to such treatment, and men, who lay claim to respectability, to practise it, or that shopkeepers, for the profit of a few pence, should sow broadcast such vulgar productions. Surely some of the photographic journals and societies, of which there are many, might endeavor to do something to elevate and purify an art that is essentially popular, and has such high capabilities for useful and honorable work.

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The Manufacture of Colored Screens.—In *Photographischen Correspondens*, Dr. Eder gives some interesting hints about the making of colored screens. He specially recommends the gelatine preparation with colored collodion. The same concentration is given to the gelatino-chloride as is usual in the manufacture of plates, and a few drops of actic acid are added in order to make the coating smoother and less liable to form streaks. This colorless coating of gelatine is allowed to dry on the glass plate, which is then dipped into the colored solution, and after a short washing, again allowed to dry. Picric acid is a suitable dye for light yellow; Manchester yellow is a stronger absorbent for blue-green. Orange-yellow is produced by orange napthol. Lastly, an orange-red tone can be obtained by erythrosin. It is recommended for a golden yellow to fix together a picric and a Manchester yellow plate. If it is desired to entirely do away with the blue-violet and the light blue, a plate of glass is dyed in picric, then in Manchester yellow, and lastly combined with another plate which has been dyed in β orange napthol. Such plates give with erythrosin plates only, yellow-green; with fluorescent plates only, green. For cyanin plates, when only red and orange effects are desired, the orange-yellow plate is combined with one colored with a coating of erythrosin. For very fine work, as for example, three-color printing, the use of such glasses may give rise to a defect, in that they are not exactly optically parallel and therefore alter the focus for each picture. For this work, the use of glass trays with glasses worked exactly optically is recommended.

AN IDYL OF THE ROENTGEN RAYS.

Though Strephon long for Chloe sighed,
She still—you guess the rhyme—denied.
Strephon, abandoned to despair,
Resolved to try his luck elsewhere;
But, ere they parted, asked her whether
They might be photographed together.
Why she consented, I don't know:
Perhaps she liked a scalp to show,
Or thought that nothing could be lost
By being done at Strephon's cost.

Now Strephon, bent upon a score,
Had squared the artist long before,
And so he chuckled, as they came
To sit to—I suppress the name.
Chloe, unconscious of the guile,
Assumed her most engaging smile;
She wore her neatest, sweetest pink,
Strephon beside her wore a wink.
Then the vile knave in Strephon's pay,
Let loose on both the Roentgen ray.

Judge Chloe's feelings. When 'twas done
She saw her charming skeleton;
She screamed and stormed and sobbed and raved—
In short, entirely misbehaved.
Strephon, who thought the opening good,
Consoled her the best way he could.
Her fury might have lasted longer
But curiosity was stronger.

She dried her eyes and dabbed her hair;
"How could you, Strephon? 'Twas unfair,
The fashion may be very recent,
I own I think it most indecent.
Still, for a minute—let me see—
And is that really, really me?"
There were her bones, and there were his
The only difference lay in this:
Something attracted the beholder
Just between Chloe's ribs and shoulder.

Chloe observed it with surprise,
And scarcely credited her eyes
"Why Strephon," rashly she begun,
"I have a heart and you have none."
Strephon, now certain of his aim,
Replied, "The case is not the same.
Mine was by nature soft, you knew it,
And with your eyes made holes all through it;
So to the X-rays it can give
No more resistance than a sieve,
But look at yours; how well defined,
How clear, how sharply 'tis outlined!
I always guessed, what now is known—
Your heart, fair Chloe, is a stone."

S. G. in *The World*.

Stains and Dyes for Wooden Frames, Cameras, etc.—*Black* stain for immediate use can be made thus: Boil 1 ounce of logwood chips in 10 ounces of water, add 1 drachm of pearlash, and apply hot with a brush. Then take a similar decoction of logwood, and add to it 30 grains of copperas and 30 grains of verdigris; strain, and add an ounce of rusty steel filings, and apply over the same work.

Blue stain is prepared as follows:—Place 4 ounces of sulphuric acid in a clean glass bottle, and add an ounce of the best indigo previously well pounded in a mortar. Set the bottle in a basin, as the contents will ferment, and may possibly boil over. When quiet, this liquor may be added to hot water in sufficient proportions to secure the depth of tint required, and the solution can then be applied hot, with a bristle brush. The color will be improved if the solution of indigo in acid is kept for some weeks before use.

Yellow.—To 10 ounces of water add 1 ounce of French berries, and boil until the decoction is a rich yellow color. The color may be brightened by adding the following mixture:

Nitric acid	1 ounce
Grain tin	30 grains

Green.—To an infusion of French berries (1 to 10) add as much sulphate of indigo as will produce the desired color.

Red.—A good bright red dye is made as follows:

Logwood chips	1 ounce
Water to	30 ounces

Boil, and add the following solution:

Nitric acid	1 ounce
Grain tin	30 grains

The logwood chips should be quite fresh, which is to be known by their bright red color; if they are stale, they will look brown, and will not yield so much color. They should be carefully freed from bark and dirt before making the decoction. Apply hot as often as necessary.

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Orange.—First dye the wood a deep yellow, and then apply the red stain until the desired effect is produced.

Mahogany.—The following is a good alcoholic stain:

Dragon's blood (in small pieces)	1 ounce
Alcohol	20 ounces

Let the bottle stand in a warm place, and shake it frequently; when dissolved and filtered it is ready for application.

Bronze.—A useful bronzing liquid is made by mixing gilt, silver, or copper-bronze powder in thin, plain collodion. This can be applied to wood, iron, or any solid material, and when dry must be protected with a coat of varnish.

Brown.—First apply a coat of a solution made by boiling an ounce of catechu in 30 ounces of water and 100 grains of soda. Allow to dry in the air, and then apply a solution of 1 part of potassium bichromate in 30 parts of water. By varying the strength of the solutions various shades are possible. They will be permanent, and act as a preservative.

Walnut.—

Washing soda	360 grains
Vandyke brown	600 grains
Potassium bichromate	60 grains
Water	20 ounces

Boil for ten minutes and apply either hot or cold.

Ebony.—Stain with a hot, strong decoction of logwood containing a little alum, and, when dry, brush the work with common gall writing ink. Small pieces of woodwork can be stained a beautiful ebony black by coating them with a weak solution of sulphuric acid (about 1 in 20), and then holding them near a fire for a few minutes. —*The Amateur Photographer.*

Photographers' Association of America.—Mr. A. L. Bowersox, Secretary of this Association, writes: The following report from C. S. Abbott, Chairman of Railroad and Hotel Committee, we beg to submit. "The Railroad Association has granted for our (Red Letter) Convention the same rates as last year, namely: One fare for round trip from all points west of Chautauqua Lake, and one fare and one-third from all points east of Chautauqua Lake." It will be remembered that the regular rates are much higher West than East, and one fare and one-third is equal to one fare West. The round trip from the following points are given below:

Boston	$14 20	Pittsburg	$7 00
Providence	14 00	Cleveland	4 75
Albany	9 53	Columbus	6 40
New York	12 00	Cincinnati	11 00
Philadelphia	13 07	Dayton	9 80
Baltimore	15 20	Detroit	6 75
Washington	16 80	Grand Rapids	11 58
Toronto R.R.	6 06	Chicago	12 00
" " and Boat	5 55	St. Louis	17 75
Buffalo	2 75	Indianapolis	13 48

Information relative to other points can be obtained from the local ticket agent.

The hotel rates will be as follows:

GREENHURST.

The Greenhurst	$2 50 per day

LAKEWOOD.

The Kent House	$2 50 per day
The Saratoga Cottage	2 00 " "
The Waldemere	2 50 " "
The Cowing Cottage	1 50 " "

JAMESTOWN.

The Sherman House	$2 00 to $2 50 per day
The Humphrey House	2 00 to 3 00 " "
The Hayward House	1 50 " "
The Everett House	2 00 " "

Please note that all photographs for display in the four divisions must be at the Convention Hall by the 10th, instead of the 12th, as formerly announced. This will give the Hanging Committee time to assort and hang them in time for the opening, the 12th.

Amateur Photography.—The *Detroit Free Pres* tells the following amusing story that certainly has the ring of one who has "been there":

GENTLEMEN—A letter from you addressed to my husband has come to hand. You ask him to write you an article for your *Photographic Annual* that is to be published next year, and you put in some taffy about his being a well-known amateur, and some stuff about what he writes being of interest, and that sort of thing. My husband is now on a photographic tour, as he calls it, and of course I open all his letters. It is not likely that my husband will be back in time to write the article you wish. When he goes off with that confounded camera of his you never know when he will come home. So I am very pleased to give you a woman's view of amateur photography, and if you print it in your *Annual* I think you will not have another article just like it.

My unfortunate husband was stricken with the amateur photographic plague about three years ago. Up to that time I always considered him reasonably sane. I made no objection at the time to his joining the army of photographic cranks, because, you see, I knew nothing of the subject. I have done everything I could since that time, but, although he has quit smoking at my request, he refuses to give up the camera habit. At the time he began this so-called recreation my house, or perhaps I should say our house, was one of the neatest in the neighborhood. You ought to go through it now. My carpets have been ruined with those abominable chemicals which he uses. I don't pretend to know their names, but I know well the effect they have. Then the bath-room is something frightful to behold. He uses that for what he calls his dark-room, and has contrivances for shutting out the light.

I noticed that in one of the books you sent him, Daguerre was the inventor of photography. He may have been the inventor of photography, but I think it was another sulphurous gentleman with the same initial who was the inventor of amateur photography.

My husband was reasonably good-tempered until he took up your diabolical art. I one time opened the door of the room in which he was working. It was all dark inside except a fearful red lamp, which threw a ruddy glow on his face and made him look as if he were going to have an epileptic fit. The moment I opened the door and let some light into the room that man went perfectly crazy. He claimed that I had spoiled a dozen of his plates, although I had touched nothing, and I came near suing for a divorce because of his awful remarks. If the evil one was not the inventor of amateur photography, then I would like to know who was. Then the pictures he does turn out when he gets them finished are perfectly awful. He has tried at different times to photograph

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the children, but the poor little dears looked like wooden images in the pictures. I went into the bath-room once with the baby and put him in the bath-tub. There was some water there already, and it looked clear enough, but in it was some horrible solution of silver that turned most of the baby jet black, and we haven't been able to get out the color to this day.

Then the cost of the thing is something frightful, although my husband carefully conceals what he spends on it. I came across one of the photographic dealer's bills the other day, and it was enough to make one's hair stand on end. Pyrogallic acid, whatever that is, was fifty cents an ounce.

Just think, if I had to pay that price for sugar! Eight dollars a pound, instead of ten cents.

Fifty cents an ounce! And that wasn't the worst of it. Now what do you think chloride of gold costs? For fifteen grains he is charged fifty cents. Now that, as you know well enough, is very near twenty dollars an ounce, and twenty dollars an ounce is over three hundred dollars a pound! I don't know how many pounds of the wretched stuff he uses every week, but if he uses ten pounds of it, and I amsure ten pounds of sugar doesn't go very far in a house with a large family like ours, you would see that that is three thousand dollars for that one thing alone, not to mention the dozens of other chemicals he uses, and I am sure I don't know what the price of them is.

I tell you that amateur photography was invented to drive a poor woman crazy who has a husband that is a victim of the villainous practice. No wonder he says he can't afford a new dress for me when I ask him for it. The house is stained with horrible solutions from cellar to garret, and I am always afraid to use any cups or glasses for fear there is some dreadful poison in them. The cat took some milk out of a saucer that had something or other of potassium in it, and it just curled up and died.

I am always afraid to sweep in any part of the house for fear it will raise a dust that will spoil something that he has tacked up on a board to dry. I wouldn't mind all this so much if he ever took a picture that was worth looking at; but, as I said before, he never does. There, now, print that in your miserable photograph book if you want to.

MRS. JOHN TRIPOD.

N.B.—If you ever write to my husband again telling him that his articles on photography will be appreciated, I will burn your letter, and you will lose your postage stamp. So just remember that.

MRS. J. T.

Phosphorescence in the Developer.—Attention was called to this by Dr. Neuhauss in 1892, and the *Photographisches Archiv* (July) has an article on these

LUMINOUS PLATES.

If a dry plate is developed with pyro soda, slightly washed, and dipped in a 2 per cent. solution of citric acid, the plate will glow with a bright light, and the same thing happens if an old fixed negative is placed in the developer, and then in the citric acid. The silver salts play no part in the reaction, as plates coated with gelatine only give the same result. Dr. Precht confirmed this in 1895 (Ph. Rundschau) and showed, further, that the gelatine was unnecessary, as a mixture of equal parts fresh pyro developer and 2 per cent. citric acid, in a test tube, glowed brightly for a minute. Lenard and Wolff obtained the same result in 1888, using alum instead of nitric acid. They attributed this result to oxydation. A. Helheim has had a similar experience. I wanted to test the effect of formalin on development, and made up the following solution:—

Water	30 parts.
Pyro	1 "
Soda Carb	1 "
4 per cent. Formalin	2 "

As the negative fogged, owing to over-exposure, I put it on one side. In a few minutes, I noticed that it was glowing. At first, it was strongest on the edges, but graddally extended to the center. The phosphorescence took place when the plate was surface dry. The light was bluish, and strong enough to be clearly seen in the light of the dark-room lamp. The solution in the dish was not phosphorescent, but on adding 30 parts of alcohol it occurred with great intensity, and could be kept up some time by shaking the dish. This seemed to show that, as the soda carbonate was precipitated by the alcohol, the same conditions existed as in Lenard and Wolff's experiment. I conclude that there is no risk of fogging a plate by this means, as no plates are developed under such conditions.

Warm-Toned Platinum Prints.—Cold developed platinum prints immersed in a bath of Uranium nitrate assume a brownish-violet tint, but do not go beyond that color, and never change to red, even by a prolonged action of the bath.

Provided always that the development of the print has been by the cold bath process, a reddish (röthel) color is obtainable by the following process:—

Add to 1 liter (34½ ounces) of the developer from 100 to 200 c.cm (3½ to 7 ounces) of a 4 per cent. solution of mercuric chloride. Less mercury produces browns of lesser intensity, while with more this intensity of color increases.

If, after developing, fixing, and washing the print is immersed in the uranium bath—

Water	1 litre (34½ ounces)
Uranium nitrate	10 grammes (2½ drachms)
Ferricyanate of potassium	2 grammes (½ drachms)
Glacial acetic acid	60 grammes (2 ounces)

the tone changes gradually to a fine sepia color, becomes reddish by a continued action, and finally turns to a positive red.

When the desired tone is attained, wash for ten minutes in pure water, acidified with glacial acetic acid, and finally rinse off.

Prolonged washing will either injure or reduce the tone.

Washing the prints in a dilute solution of ferric chloride turns them green. In order to eliminate from the print all excess of iron, wash in water acidulated with hydrochloric or acetic acid.

Continual washing of a green print in water tends to reduce its color intensity which can, however, be restored by again treating it with a solution of ferric chloride.—*Photographische Correspondenzen.*

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TRADE NOTES.

Martin G. Good will move to larger premises at 92 State Street, Chicago.

The Sunart Photo Co., of Rochester, N. Y., send us some excellent samples of work made with their cameras.

Ralph J. Golsen, the well-known stock dealer at 146 State Street, Chicago, sends us a copy of his latest bargain list. If you are looking for any article at a reasonable rate, write for a copy.

A company has been formed in England with a capital of $300,000, to work the Paul's Animatograph. It is stated that the net profits during the past year were nearly $65,000.

The Busch & Lomb Optical Company celebrate the twelfth year of their production of photographic lenses by the extension of their photographic lens department, the new addition covering 8,000 feet of floor space and providing facilities which the rapid increase in the demand for their lenses has made imperative.

Henry Burke, for many years with the Geneva Optical Co., the Treleaven Optical Co. and Martin G. Good, has entered into partnership with Mr. James, and will manufacture various photographic novelties, such as flash lamps, rests, washers, etc. The firm will be known as Burke & James, and their headquarters will be at 89 Madison Street, Chicago.

"Ray Filter Photography," beautifully illustrated with half-tone etchings of cloud and landscape Ray-filtergraphs and distributed by the Bausch & Lomb Optical Co., Rochester, N. Y., gratis, is one of the most pleasing and instructive booklets of the year. Everyone interested in photography should write for a copy.

Elmer Chickering, says the Boston *Journal*, is corresponding, and expects to close the deal with Marceau (who is the most eminent of Western photographers), to have a wagon constructed in partnership, the cost of the same when completed $6,000. This wagon is to be used one year by Elmer Chickering, and the next year by Marceau, of San Francisco. It is to be drawn by six handsome horses, and will be probably the most elaborate thing of the kind ever constructed in this country.

The American Annual of Photography for 1898 is now in course of preparation. Advertisers desirous of being represented in its pages should apply at once for terms, etc. The edition will be even larger than last year or more than double that of any other photographic publication in America. If you are an up-to-date manufacturer or dealer you cannot afford to be absent from its pages. Times have been hard; but they will be harder yet to the man who does not advertise, but who sits down with the idea business is going to come to him instead of hustling to get it.

TRADE NOTES.

Popular Photographic Printing Processes.—We hear that Mr. Hector Maclean, F.R.P.S., president of the Croydon Camera Club, whose book "Photography for Artists," published last year, obtained such a good reception, has now in the press another work under the first-named title, which is likely to prove very acceptable to all who work with a camera. The book, which will be fully illustrated, is to be published by Upcott Gill at the popular price of one shilling.

Simplex Printing Frames.—"Necessity is," indeed, "the mother of invention" and manufacturers of photographic specialties are doing their utmost to produce good goods at the least possible expense, since now-a-days the public will only take hold of things which cost least. The prices on wooden printing frames have been reduced to that extent that there is no profit left for the manufacturer, even though inventive genius has done everything possible to reduce the cost of production. The Scovill & Adams Co., of New York, have



solved the problem of inexpensive printing frames, by setting aside entirely the wooden frame, and building this article on different lines, such as the simplex printing frame which they have lately placed upon the market. The frame is built of Japanese iron with a wooden back covered with billiard cloth. In this way they have been enabled to produce a printing frame that is very compact, light and mechanically true in every respect. This printing frame is very attractive in appearance, and all those who see it declare that it will sell on sight. In fact, we understand that the first few thousand that they made, were sold within a few days after the article was placed upon the market, even though no advertising has not been done, to create a demand for the frame. The price is an attractive feature, the list of the 4 x 5 size being 25 cents as against 38 cents, the list price of their wooden frame. The price of the 5 x 7 size is 32 cents. By this it will be seen that

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TRADE NOTES.

a frame, superior in construction, yet cheaper in price, is bound to have a great demand, and the Scovill & Adams Co. will certainly reap the benefit of their endeavors to reduce the cost of printing frames.

It might be worth your while to send for particulars of the Lundelius Camera.

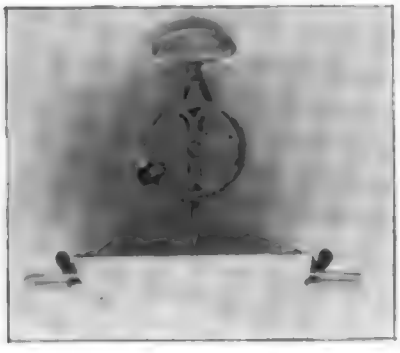
A New Whirler For Photo-Engraving. The Simplex,—All those interested in photo-engraving will be attracted by the headlines of this announcement of a new whirler, for the absence of a good practical device for whirling the plate while drying it over the stove in the half-tone enamel process, has been a serious drawback to photo-engravers, aad especially so to the amateur experimenter, who cannot afford to invest in expensive tools. The prime essentials in a whirler can be summed up as follows:

An even rotary, gradually increasing movement by momentum force, in order to avoid sudden jerks.

A good device for the easy adjustment of the whirler for several size plates, lightness and compactness, so that the whirler may be held in the hand while the plate is whirled over the stove, and so that the plate may be quickly and dexterously turned face down after being coated.

All these conditions are embodied in the *simplex* whirler, which The Scovill & Adams Company of New York have just introduced, as illustrated by the following cuts:





This announcement will surprise photo-engravers when they learn that the whirler above referred to can be bought for $4.00.

PHOTOGRAPHIC PATENTS GRANTED DURING THE MONTH OF MAY, 1897.

(Furnished for the Photographic Times by Wm. S. Hodges, Patent Lawyer, Washington, D. C.)

581,540. Photographic Apparatus. John Dennis, Rochester, N. Y., assignor, one-half to S. W. Puffer, same place.

The inventor employs in connection with a source of X rays, a fluorescent or sensitive surface, and two non-permeable bars arranged in the same plane in the radiographic field between the source and the surface. The said source, surface, and bars are relatively adjustable, and one of the bars is placed between the source and the radiographic object and the other between said object and said surface.

581,808, Tripod Stands for Photographic Cameras. W. F. Carlton, Rochester, N. Y.

The point of novelty in the present case consists in two tripod sections, one of which, the body action, is composed of two longitudinal bars connected together, the other or intermediate section, being composed of two longitudinal bars which are spaced apart, and connected at their lower ends, being free to move to and from each other at their upper ends. The bars of the intermediate section are arranged to slide between the bars of the body section. A spindle is secured to one of the bars of the intermediate section, and provided with an inwardly projecting screw-threaded end, a stud being carried by the opposite bar and designed to project inwardly and in line with the spindle. A clamping sleeve is mounted on the spindle and adapted to slide freely over the stud, whereby the free ends of the bars of the intermediate section may be clamped against the bars of the body-section.

581,831, Photographic Printing Frame. T. B. Perkins, Grand Rapids, Mich.

The inventor claims an improved article of manufacture, consisting of two frames hinged to each other at one side, and separably secured at the other side, said frame having plain adjacent surfaces provided with elastic facings. One of said frames is provided with an opening of not less than the dimensions of the prints to be made, and the other frame is provided with an opening of the same dimensions as the paper to be printed. A removable spring-pressed backing fits the latter opening.

581,984, Photographic Shutter. W. V. Esmond, New York, N. Y., assignor to the E. & H. T. Anthony & Co., same place.

This is a shutter mechanism embodying a centrally pivoted shutter having the piston of a pneumatic device eccentrically connected therewith. A spring is located within the cylinder of the pneumatic device, and a detent on the shutter. A pin is also secured to the shutter, and a pivoted latch is mounted to be thrown into and out of the path of said pin.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF MAY, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

581,998, Automatic Photographic Machine. J. F. Raders, New York, N. Y., assignor by mesne assignments to Automatic Photographic Machine Co., of West Virginia.

In carrying out the invention a plate holder is operated by suitable means - means being also provided for controlling the exposure of the plate. A bath for holding the liquid in which the plate is to be immersed is also employed, and means are provided for causing a relative movement of the plate carrier and bath. A suitable motor fluid is designed to flow to and from each of the means mentioned, the proper order and time of such flow being regulated by automatic controlling devices.

582,189, Photographic Shutter. C. D. Durnford, London, England.

A screen or diaphragm is provided with an opening adapted to vary the admission of light during exposure, and shields are arranged to move in relation to the lens tube. Means are provided whereby the screen or diaphragm and the shields will be operated in proper relation to each other for effecting an exposure suitable for different parts of a picture, one or more of the shields being provided with fringe on their edges.

582,219, Photographic Shutter. J. A. Mosher, Chicago, Ill.

A reciprocating shutter is provided with a reciprocating actuating part, an expanding spring being adapted to form a connection between the shutter and its actuating part. The point of connection or attachment of the spring to the shutter mechanism has a reciprocating movement between positive stops and in a path shorter than and non-coincident with the path of the point of attachment of the spring to the actuating part.

582,311, Kinetographic Camera. A. F. Parnaland, Paris, France.

In connection with an objective and a film guide, the inventor employs a winding spool for the film and a driving roller over which the film is adapted to pass, said roller having side flanges. A second roller, also having side flanges, is mounted upon a suitable spindle, said spindle being mounted in oscillating arms carried by a second spindle. Springs secured to said second spindle and bearing upon the arms. The flanges on the driving roller and those of the second roller are provided with co-operating recesses and projections, the driving roller being also provided with radial pins.

582,376, Automatic Register for Printing Frames. S. H. Seckner, Fort Collins, Colo.

A shutter having a suitable locking spring is provided with a registering disk pivoted thereto, the latter being provided with a series of numbered peripheral teeth. A lever is pivoted to the shutter and provided with a spring pawl adapted to engage the teeth of the disk. A plate is secured to the under side of the spring and provided with a lug, a link being connected at one end to the latter and at its other end to the free end of the lever, a suitable device being arranged to limit the movement of the lock spring.

582,710, Stereoscope. H. C. White, North Bennington, Vt., assignor to H. C. White Co., same place.

A shaft and lens frame are provided with a fastening latch, the lens frame being provided with a hole through which protrudes a headed stud carried by said shaft. The latch is in such position as to be turned into engagement with the stud behind the head thereof, whereby the parts are locked together.

582,855, Photographic Camera. E. R. Freeman, Boston, Mass.

This is a camera comprising in its construction a rotary holder, having means for supporting individual sensitive plates or films, a box-shaped slide or partition being adapted to be moved to and from the holder to retain it in position or release it therefrom.

582,995, Photographic Camera. Silas French, Rochester, N. Y., assignor one-half to Albert Beir, same place.

A collapsible camera having a front, back and bellows, is provided with a pair of crossed links pivoted to the front near its outer edges, a pair of crossed links being also pivoted to the back near its outer edges. Each link extends inward beyond the point of crossing and is pivoted to one of the opposite pair. A spring catch is provided, the same consisting of a slot in one link, said slot being contracted at one end and adapted to receive a pin carried by its crossed link.

Certificate of trade-mark registration No. 29,977 was granted to The Blair Camera Company, Boston, Mass., for the word "Hub" as applied to Powders, Solutions, Trays, Developers, and other Photographic Apparatus and Supplies.

Trade-Mark Registration No. 29,857 was granted to THE FIRM CARL ZEISS, Jena, Germany, for the word "Planar," applied to optical instruments and parts thereof.

Trade-Mark Registration No. 29,860 was also granted Hastings and Miller, of New York, N. Y., for the word "Hasler," applied to photographic developing and toning solutions and salts and papers.

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Vol. XXIX. AUGUST, 1897. Number 8.
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THE PHOTOGRAPHIC TIMES



AN-ILLUSTRATED MONTHLY-MAGAZINE DEVOTED-TO-THE-INTERESTS-OF-ARTISTIC & SCIENTIFIC-PHOTOGRAPHY.



THE-PHOTOGRAPHIC-TIMES-PUBLISHING-ASSOCIATION-60-AND-62-EAST-11TH-ST.-NEW-YORK.

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THE
PHOTOGRAPHIC TIMES.

VOL. XXIX. AUGUST, 1897. No. 8.

PHOTOGRAPHY IN THE "PRAIRIE STATE."

BY R. R. BOURLAND.



By R. R. BOURLAND

THE residents of the east and the west of the United States live in the midst of scenery, which for beauty rivals the noted resorts of Europe. The snow-capped peaks and verdant valleys of New England — the rugged mountain passes of the Appalachian range with all the natural and artificial beauties of the Hudson river, its Palisades and palaces—the lakes of western New York and the legendary "Kaatskills." All the spots hallowed by the struggles of the Revolutionary days, are the heritage of the East. The canyons and gorges of Colorado—the Old Missions and tropical beauties of California, sometimes a picturesque group of Indians, are the heritage of the West. These offer to the eastern or western amateur endless opportunities for making a collection of gems which for its value and pleasure-giving power depends only upon the taste, skill, and artistic eye of the operator.

There is a great stretch of country lying between these two extremes of location, which furnishes few, indeed, of the subjects for illustration of our magazines. It is the great middle prairie belt, which has for its center the "Prairie State," Illinois. Many people think of Illinois as one vast level stretch of farms and fields, of grain elevators, telegraph poles, and red school houses, with no picturesque peasantry to give life to the prairie view, no thatched-roofed or vine-covered cottages to add poetry by a suggestion of an ideal existence: still there are opportunities for the exercise of our art. Here are hills and valleys, streams with perspective as beautiful as that of the Connecticut Valley, and that one day by aid of the landscape artist, will rival the charms of the Bronx.

Often it is the experience of the amateur that he suffers great disappointment in the result on paper of his effort to photograph a scene of magnificence, because the effect of great distance and the power of the scene is lost; often again he is surprised by the beauty and charm of a simple rustic scene which lies as artistically on paper as it appeared to him in nature. Such are our prairie scenes, close to nature, touched with the simplicity of a sketch: But not always so, for we have here also rocky valleys, wooded hills, trees of many varieties, noble oaks of unknown age and rugged form, soft willows, stately elms, maples and "Lombardy poplars," and the wind-swept sand dunes with the "scrub-oaks" (so effectively used by Clements) can be found here. But our river valleys with their peculiar and ever changing beauty are our pride and joy.

We have our legends also in Illinois. The early history of our state, the life of pioneers among the Indians, the journeys of the French explorers La Salle, Tonti, Père Marquette, and Joliet have left us historic points points at

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THE RETURN FROM SEEDING BY R. R. BOURLAND

fences once so plenty are fast disappearing and are already much sought by sketchers.

The Vermilion river, rising on the great eastern prairie of the state, winds its way through farms, between low hills, with many a picturesque bend and cozy nook, rocky dam and fishy pool, until, as it approaches its end at the Illinois river, brings (let us say "the photographic canoeist) to the opening of Deer Park, a rocky glen of renowned beauty, where the unique fact of a "canyon" in Illinois is found: with high rocks for its sides, which are covered with mosses and clinging evergreen shrubs, ending in a pool with a washed out basin which is a marvel to all visitors and a delight to him who has a camera at his side. Only three miles away is Starved Rock, while between the Vermilion river and Ottawa (at the mouth of the Fox river) lies a series of these rocky valleys, each of which presents a new view of glen scenery.

"Starved Rock," Peoria (Fort Creve-Cœur), Kaskaskia, Rock Island, and many other places. Between here (Peoria) and Rock Island, was fought the "Black Hawk" war. Around his "watch tower" on the Rock river near the Mississippi are many beautiful and interesting spots.

So let the amateur, surfeited with mountains and rugged places, come to us for a season: come and hunt up the representatives of the craft in Peoria, Rockford, Rock Island, or Ottawa. He will find an enthusiastic welcome awaiting him, and be given a guide to the beauties of Kickapoo creek, Rock river, or the Illinois river as the case may be; then he can return with a valuable addition to his collection, of beautiful and interesting landscapes.

The vine-covered cottage is replaced often by the log cabin. These are becoming rare; indeed before long they will exist only in the memories of their owners and in the scrap prints of the amateur photographer. Picturesque rail



MINERSVILLE BEND BY R. R. BOURLAND

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A RUSTIC BRIDGE BY R. R. BOURLAND

The southern end of the state is still more rugged, and is untrodden by the amateur photographer. The valley of the Ohio river offers a charming change from the views of the northern part. Sandy banks, cypress swamps, old bridges, rocky fords, ox teams, and a race of people who are away behind their northern brothers in manners, customs and dress. Old log cabins are plenty there, but all is showing the march of the vandalism which we call civilization, and ere long the primitive beauty of the forests together with the log cabin and the rail fence, will be gone.

Now is the day to take advantage of the relics of the past. Every year brings us nearer to the day of artificiality. We are exchanging the beauties of nature for the works of man, the wild landscape for the park view, the lane for the avenue.

Come and see us before the transformation is complete.

Unmounted gelatine or albumen prints may be prevented from curling by immersing them for ten minutes in the following solution after removal from the last washing water.

Water	1 part.
Alcohol	4 parts.
Glycerine	3 parts.

FOCUSING ATTACHMENTS FOR CAMERAS. BY E. J. PRINDLE.

I IMAGINE that it was after an experience at viewing on a windy day when some of the strongest desires were born to find a substitute for the focusing cloth. Even before starting for the scene of operations it began to excite disapproval on account of its share in making the carrying case so bulky. After arriving and setting up the camera (if the wretched article has not been forgotten) the focussing cloth is unfolded and laid on the bellows only to be blown back against photographer's face. A second attempt secures it in place, but it insists on bulging out away from the sides of the camera ; and, when this evil is corrected, the light still finds its way from below to obliterate the image. Then and there a vow is registered with the gods that we will never again be dependent on the luckless focusing cloth.

One of the simplest substitutes for the focusing cloth, shown in Fig. 1, consists of a pyramidal bellows which is secured to the frame which carries the ground-glass, the frame in this case sliding in the ways which also receive the plate-holder. A coiled spring wire which

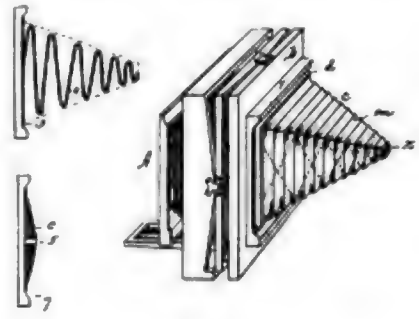


FIG. 1.

takes the shape of the extended bellows, when free, is secured to the frame inside of the bellows. The eye is applied to the opening in the small end of the bellows in focusing. When not in use, the bellows and spring are flattened against the ground glass and are secured in place by a strap.

The focusing shield, shown in Fig. 2, is more convenient if somewhat more elaborate than that just described. Only the back of the camera is shown. The bellows is attached as before and has a large opening at the rear end which is provided with a frame. The frame is supported at each side by lazy tongs which run

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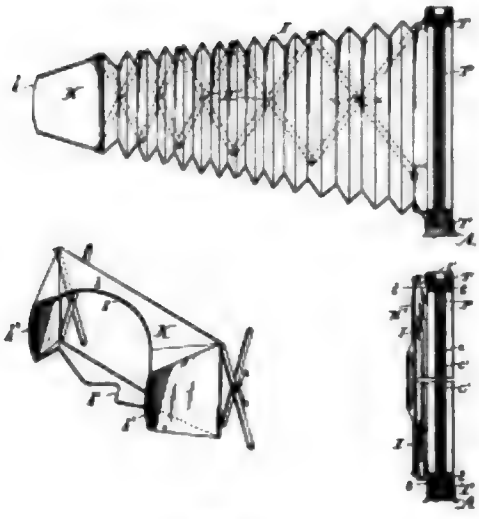


FIG. 2.

from the camera-back, to which they are hinged for convenience in folding up the shield. A hood is secured to the frame in the smaller end of the bellows, and its free edges are cut to closely fit the face. It is creased to fold up flat against the bellows.

The attachment shown in Fig. 3 is adapted for use with the camera reversed as well as in its upright position. A sleeve-like cloth body is attached to the ground-glass frame, and carries in its outer end a circular frame. A circular board fits a rabbet in the frame and is secured therein by turn buttons. Two eye pieces are fitted in the circular board, and a rubber band is looped from one side of the board to the other, so that the eye pieces may be held up close to the eyes by passing the band over the head. The attachment is adjusted for the reversed position of the camera simply by turning the circular board.

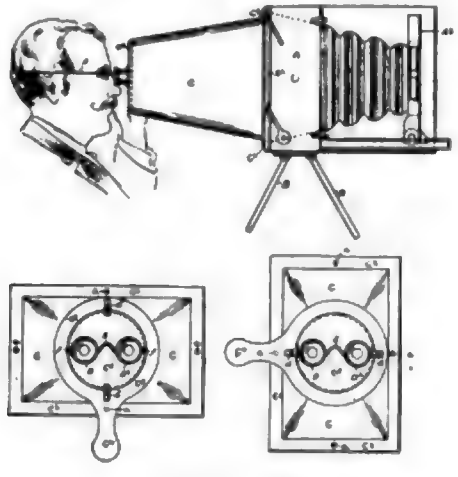


FIG. 3.

The focusing attachment last described has been modified, as illustrated in Fig. 4, by providing rectangular wire frames at intervals in the sleeve to keep it well opened. A ring at the back forms a bearing for a rotatable ring to which is attached a shield. In the edges of the shield are secured elastic bands so that the shield may be secured on the head. The rotatable ring allows of reversing the position of the hood when the camera is reversed.

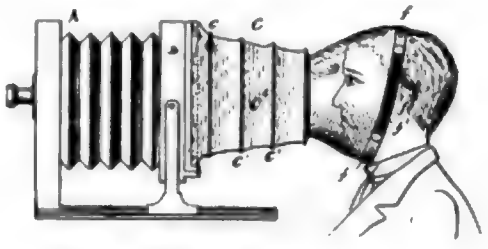


FIG. 4.

As it is necessary to bring the spot to be focused directly between the eye and the lens, and as the devices thus far described do not permit much lateral movement of the head, they limit the focusing to the center of the plate. A focusing attachment which permits every part of the plate to be focused is shown in Fig. 5. A shallow, open-ended box or frame is attached to the ground glass frame, and a box, open toward the camera, telescopes with this shallow frame. In the upper and lower

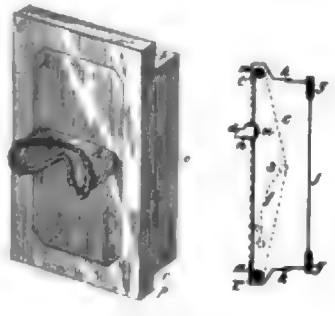


FIG. 5.

edges of the rear box are two rollers, to which is secured, by its upper and lower edges, a curtain. A hood, to fit closely around the eyes, is secured to the curtain around an opening therein, and is adapted to be moved up and down with the curtain in an opening in the rear of the box. Two cords are wound on the rollers reversely to the curtain, and, under the pressure of two spring mounted rollers, keep the curtain taut.

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Efforts have been made to overcome the inconvenience of the inverted image on the ground glass, as this greatly hinders a proper study of the lighting and pose. Fig. 6 shows a focusing attachment, which overcomes these faults, though somewhat imperfectly. A rectangular board is secured by flanged metal stripes to the back of the ground glass frame, and to the lower edge of an opening in this board is hinged a leaf having a mirror on its forward face. A second leaf is hinged to the upper edge of the opening and is hooked to the free edge of the lower leaf. An eye opening is formed in the upper leaf, and is provided with a shield which fits the face. The triangular

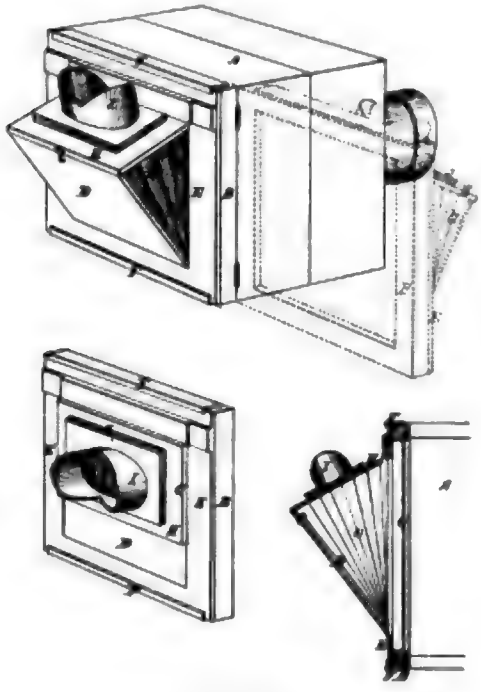


FIG. 6.

openings at the side are closed by pleated curtains. On looking through the eye opening at the mirror, the image is seen erect, although the view is somewhat cramped. When not in use, both leaves may be folded flat against the ground glass frame.

The camera, illustrated in Fig. 7, accomplishes the erection of the view on the ground glass in such a position that it much easier to observe than with the construction shown in Fig. 6. The ground glass is placed in the upper side of the camera and is covered by a leaf hinged at the forward edge of the ground glass, and connected at its side edges to the camera box by light-tight fabric. A mirror is hinged on a rod that extends across the upper part of the camera's interior, and is journaled

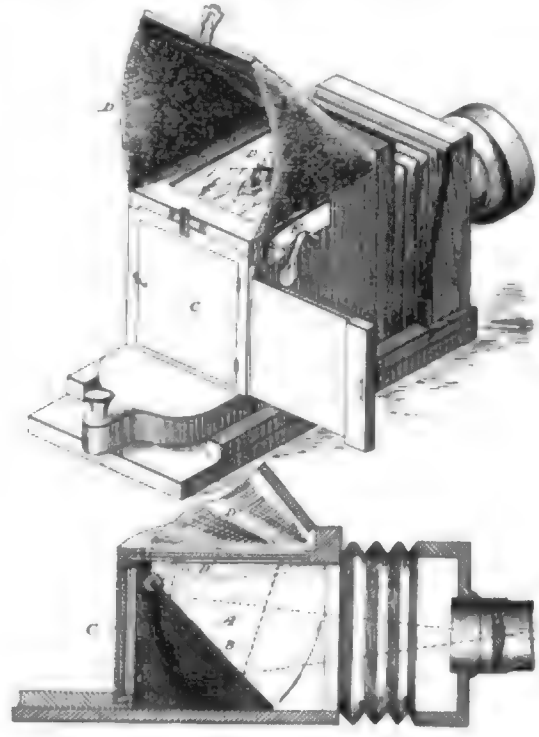


FIG. 7.

in its sides. One end of the rod extends through the camera side and has a handle secured to it, and the handle is held in either of

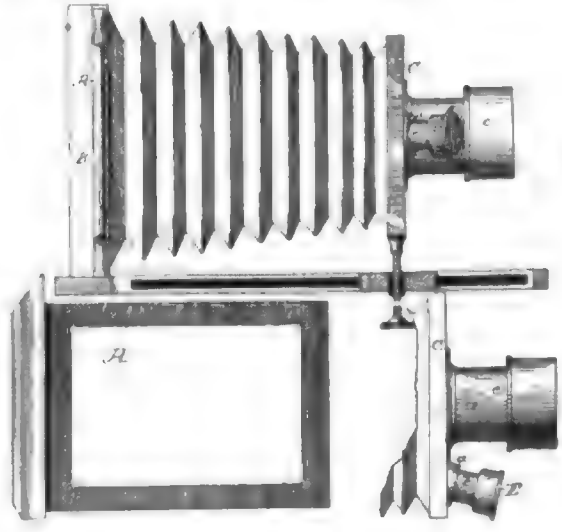


FIG. 8.

two positions by a spring catch. When it is desired to focus, the handle is turned to lower the mirror, in which position it reflects the

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image to the ground glass, where it appears right side up. During the exposure the ground glass is covered by the mirror by turning up the latter so that the light may reach the sensitive plate, and so that none may enter through the ground glass.

Perhaps the most ingenious attachment devised to aid in focusing is that which is the subject of Fig. 8. The sides of the plate-holder slides, which are turned outward, are painted white or covered with white paper. An opening is formed in the front board, to which is secured a metal tube having a removable cap. When the plate holder is in place in the camera, and the tube and lens are uncapped, the image is thrown on the whitened slide of the plate holder, and may be distinctly seen through the tube. If it is desired, a magnifying glass may be placed in the tube.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER I.

BOOK II.

TECHNIQUE AND PRACTICE.

"Artists are supposed to pass their lives in earnest endeavor to express through the medium of paint or pencil, thoughts, feelings, or impressions which they cannot help expressing, and which cannot possibly be expressed by any other means. They make use of material means in order to arrive at this end. They tell their story—the story of a day, an impression of a character, a recollection of a moment, or whatever, more or less clearly or well, as they are more or less capable of doing. They expose their work to the public, not for the sake of praise, but with a feeling and a hope that some human being may see in it the feeling that has passed through their own mind in their poor and necessarily crippled statement. The endeavor is honest and earnest, if almost always with a result weakened by over-conscientiousness or endeavor to be understood. . . . Your work is exhibited not with the intention of injuring any of the human race. It is a dumb, noiseless, silent story, told, as best it may be, by the author to those whom it may concern. And it does tell its story, not to *everybody*, but to *somebody*."

WILLIAM HUNT.

CHAPTER I.

THE CAMERA AND TRIPOD.

THE camera as used to-day is a modified form of the camera obscura adapted to the special end of taking photographs. It is essentially nothing but a light-tight box, to one side of which a lens can be adjusted, and to opposite side of which the slide containing the sensitive plate can be applied and exposed, so that it receives no light, save that passing through the lens. There are many patterns and many minor differences in the construction of these boxes, some few of real value, but the majority are of no advantage. In all apparatus the student should choose the simplest and strongest, for in pictorial work lightness *per se* is no object, nay, it may be harmful, as leading to over-production. In fact nothing should stand in the way of getting the best results, and though many of the cameras on the market are light and fitted with numerous devices which are said to simplify operations and help the worker, yet such is not really the case, and these thousand-and-one aids to work are apt to become deranged, and finally to embarrass the photographer at some critical moment.

In choosing a camera, then, for landscape work, choose a square one, with a reversing frame, a double swing-back, and good leather bellows, these being better than flat sides, as the light is not reflected from the sides of the box into the plate, the bellows thus act as diaphragms. Let the flange of the lens be fitted, to a square front which can be easily removed and replaced, and let there be a rising front, but do not have a movable front, for the lens should always be at right-angles to the focal plane. It is advisable to have the camera brass-bound for the sake of its preservation, and if for use in tropical climates the bellows should be made of Russian leather, as the oil of birch with which the leather is cured is most distasteful to insects. In ordering a camera there are a few points which experience has led us to consider essential to comfort. One is that the part of the base-board of the camera which rests on the tripod head should be strengthened or made of much stouter material than is usually used. Another is that the thumb-screw should be of much larger diameter than is usually the case, and this should be borne in mind, even in the making of the smaller cameras, for on a windy day when the camera has a heavy lens on one end and a loaded double dark slide on the other, the vibration is often ruinous to the picture during exposure, while sudden gusts of wind may even crack the wood round the screw hole. It seems to us a thumb-screw at least half an inch in diameter should be used, unless the camera be made to fit into the

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tripod head, a method often adopted of recent years, and of course the best way of all. On more than one occasion we have nearly lost the camera altogether in the water when trying to screw it to the tripod when working from a boat on a tide-way, but by having a part of the base-board made to fit into a wooden tripod head, this at times most difficult operation is rendered easy and certain.

The camera should always extend and close by means of a tail-screw, those opening by means of a rack and pinion are much more liable to get out of order. Of course this remark is not applicable to the smallest sized cameras. A round spirit-level sunk into the tail-piece of the camera is useful. In ordering a camera the two vital points to be considered are the size, including the length of the bellows. The size of plate you intend working with determines the size of the camera. We have worked with all sized cameras, from quarter-plate up to one taking twenty-four by twenty-two inch plates, and it is only after long experience and much consideration that we venture to offer an opinion on the size to be chosen. For ordinary work, then, we recommend the half-plate size as the minimum, and the ten by eight inch size as the maximum. Perhaps a whole-plate camera ($8\frac{1}{2} \times 6\frac{1}{2}$ inches) is on the whole as useful as any. The strength required to do a day's work with a twelve by ten inch camera is beyond any but a strong man. It is assumed, of course, that the pictures of the sizes cited are for albums, portfolios, or book illustrations. It must be remembered, however, that the size of a picture has nothing to do with its pictorial value, a pictorial quarter-plate picture is worth a hundred commonplace pictures forty by thirty inches in size. For producing large pictures for the wall, however, we consider the camera should be between fifteen by twelve inches and twenty-four by twenty-two inches; we cannot imagine anything larger than twenty-four by twenty-two inches for outdoor work, and our memory goes back to a marsh road in Norfolk, where we and two peasants had all we could do to carry a twenty-four by twenty-two inch camera when set up from one marsh to another.

The student will of course remember that his camera must be square in order to have a reversing frame fitted, but that makes no difference to the size of dark slides. Having then fixed on the size of his camera, a question requiring the greatest thought, he must next tell the maker the length of bellows he requires, which is usually measured from front to back when the camera is racked out to its full length. As we recommend the use of long-focus lenses, as will be seen in the chapter on lenses, and as no definite law can be laid down for this length, it is advisable to order a camera four or five inches longer than the focal length of the lens which is advertised to cover the next larger size plate to that which your dark slide holds.

And now for a caution against a fallacy current in photographic circles, which is that one size of plate is more suitable for pictorial purposes than another. The size of the plate has nothing whatever to do with success or beauty. Every composition will demand its own particular size and shape, and say you work with a ten by eight inch camera, you will find you will often take a nine by four inch or a ten by three inch plate or a dozen other sizes and cut off all the rest. All fanciful rules for fixing on the size of a plate for pictorial reasons cannot be too strongly condemned. Such things must be left to the individuality of each worker, and every picture-gallery in Europe gives the lie to all rules for a choice of size. The photographer, must of course, suit his plate to his subject, not his subject to his plate.

For studio, or indoor work, the camera may of course be heavier for obvious reasons, and a different form of support is necessary, the one usually adopted being very convenient for lowering or raising the lens so that the best point of sight is obtained according to the position of the model. It seems to us, however, that these studio cameras and stands are made a great deal too heavy and cumbersome. For this kind of work a very necessary part of the apparatus is a hood of some dark material fixed on to the front of the camera and extending above and beyond the lens, in order to obviate the effect of the numerous reflections always present in a glass studio. Out of doors this is only necessary when the sun is shining into the lens; otherwise it is never needed, for we have tried it, and have proved that its use has in no way improved either the truth or the quality of the negative. In cases where the sun shines into the lens a hat, a piece of cardboard, a folded newspaper, or anything of the kind, will answer the purpose equally well.

The tripod head should be preferably of tough wood covered with felt. A metal tripod head is apt to endanger the woodwork of the camera,

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even when covered with leather. The legs should be simple and firm, the best we know of being made of two pieces of ash or oak hinged at the bottom, the points shod with iron, and the legs being stiffened when in position by a bar of iron which is secured by a hinge. Every one should have two pairs of legs at least; one pair, so that when the camera is set up the lens may be on a level with the eye of a man of average height, and one pair shorter, so that the lens is only three feet from the ground. In addition to these we always have handy three tough poles eight feet long and about the diameter of a broomstick; these are shod with iron heels, and have notches cut at the unshod ends. These are most useful to lash to the long legs when using them in water-ways. It is as well to have six double-backs, for by filling them all at one operation the student empties a box of plates, and so avoids a chance of mixing exposed and unexposed plates. The most convenient method of carrying the plates in all cases up to and including the ten by eight size, is to have a bag made which will take the camera, three double-backs and the focusing cloth, and a separate bag for the other three double-backs which can be left behind or taken out at pleasure.

A very useful piece of apparatus is a clamp which can be screwed on anywhere, but especially to a boat's gunwale, the taffrail of a steamer, a fence, and many other places whence good pictures can often be secured. Such a clamp can be purchased at most of the dealers' shops.

Having decided on these matters, we will suppose the novice is now provided with camera and tripod. Now for a few details about starting. In setting up the camera on its tripod, one leg should be placed either between the photographer's legs or exactly opposite to him, he will then find he can command the camera easily and alter its postion with a touch. If, on the contrary, the legs are put up by chance, he will soon find his lens playing all sorts of gymnastic tricks, one moment looking fixedly up at the stars, the next studying with the deepest interest the ground at its foot.

The manipulation of the rising front is a power needing considerable study, for, by moving it, you can regulate the amount of foreground you wish to include in your picture. The limit of rise of the front is determined by the manufacturer, and the limit beyond which the student must not go is determined by the covering power of the lens he is using, for he will remember that every lens only covers a certain circle, the area of the circle depending on the construction of the lens. The usual method of describing the covering power of a lens is to give the measurements of the greatest parallelogram that can be inscribed within this circle. It will be easily seen that if the lens we use only just covers the plate, that when the front is raised above a certain point, the lower corners will have no image exposed on them, and the higher the lens is carried, the more of the lower part of the picture will be cut off. As the image is upside down, the blank corners will appear in the sky of the negative. It is then obvious that if the covering capacity of the lens is greater than needed for the plate used, the rising front may be used to a much greater extent than if you only use a lens covering the plate you are exposing. It must always be remembered that if the optical axis of the lens be raised above the center of the plate the illumination may be unequal.

The effect of the horizontal and vertical swing-back is identical, as is obvious if the camera be placed on its side, for the horizontal swing becomes vertical, and *vice versa*. If the camera be set up plumb, the effect of using the vertical swing-back to its extreme limits (which are determined by the mechanical construction of the camera) is to lengthen objects in the direction of their obliquity and to sharpen the focus of some of them, whilst objects in other parts are blurred and dwarfed. What does this mean from an art point of view? It means that as a rule it throws the whole picture out of drawing, the relative positions of the planes are altered, the relative definition in the planes is altered and with it the relative values, and therefore, as a rule, the picture is artistically injured. This rule-of-thumb use of the swing-back arose, no doubt, from the practice of those whose aim was the production of "sharp" pictures, for with the swing-backs they invariably use small diaphragms to obtain sharpness all over. For architectural work the swing-backs should never be used and the camera should *never* be tilted. The swing-backs can, however, be used, with the greatest caution, in pictorial work, and their value can scarcely be overrated, but it requires great knowledge to use them appropriately. The subtle changes in the drawing and composition of a picture which can be obtained by an intelligent use of the two swing-backs, make them, to those who know how to use them, most valuable tools. But if

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From painting by E. Duclos.

"NOW LOOK PLEASANT"

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the beginner will take our advice, he will keep his ground-glass plumb, and his horizontal swing-back square, and never venture to alter either until he has thoroughly mastered his *technique*, and has some insight into the principles of art. The use of these swing-backs seems so easy, as of course it is, when "sharpness" is all the desideratum. By their means, the appearance of the whole scene can often be more truly rendered, and things can be subdued and kept back in the most wonderful manner; and since we wish to get a true appearance of the scene we are interested in, not a realistic wealth of detail, it can be easily understood how invaluable are the swing-backs when used cautiously. Muybridge's galloping horses are in all of their movements scientifically (realistically) true, but many of these are never seen by the eye, so quick are they, and they are, consequently, not true to illusion. On the other hand, the student, if he goes to the British Museum, can see in the Parthenon Frieze that the sculptors in some cases carved the legs of the farthest of three horses in higher relief than those of the nearer horses, but if he goes off a few paces and *views the carving in its entirety*, he will see the true appearance is gained; the nearest legs look the farthest off, and so the work is true in illusion, though not true in absolute fact. And though the use of the swing-back makes the drawing scientifically a little false, yet if the proper lenses be used, the falsity is so very slight as to be hardly noticeable. Indeed, it may give a truer impression.

By perforating a thin metal plate with a minute hole, large enough only to admit a pin's point, and fitting it to the front of the camera in place of the lens, an image will be thrown on the focusing screen, as the piece of ground glass at the opposite end of the camera is called. If the image be received on to a sensitized plate, it will be impressed on the plate, and can be developed in the ordinary way. But such a "pinhole" photograph is absolutely ruined by lack of tone, and since the exposures required to produce pictures without lenses vary roughly from one to thirty minutes, this method cannot be seriously considered here, for, as we shall show, within certain limits, the quicker the exposure the better; nevertheless, the drawing of pictures taken in such way would obviously be scientifically more correct, but the lens gives the operator greater power of modifying the planes of the view and producing truer tone and no differential focus can be got with a pinhole, for everything is sharp. Indeed, we have never seen anything done with a pinhole that could not be better or as well done by a lens, and the best things we have seen could never have been done by a "pinhole." Mr. Spiers was the first to produce pictorial "pinholes" and some uncultured persons out-Heroded Herod and called "pinholes" printed on rough papers (after Col Murie's example) "impressionistic photographs"—and themselves "impressionists," to such depths of folly will blatant and pushing a coxcombery go.

The student must be careful to see that the inside of the camera is a dead black, and that it keeps so. At times the camera may leak or get out of register, that is, the plate does not exactly take the place of the ground glass, in which case he should at once send his camera to the maker. Should the student wish at any time to test the register of his camera, he has only to pin up a printed card and focus it as sharply as possible, using his lens at full aperture, using a magnifying glass, if one is at hand. Then load the dark-slide with a plate of ground-glass, and after sliding it into position, open the slide (if a double-back) when the image will be seen on the ground-glass plate, and its sharpness can be noted. The other side of the dark-slide is then tested in the same way. If perfectly sharp, the camera is in register.

A good form of small camera to be carried in the hand is still a great desideratum for studies. Exquisite studies of figures, birds, and all sorts of animal life could be made with such a contrivance, studies admirably suitable for tail-pieces or illustrations to go in with the text. That there are dozens of patterns of hand cameras commonly called "detective cameras," we are well aware, and we have tried some of the best, but we have found none satisfactory for our purposes, and can therefore recommend none. We may here remark that the name "detective camera" is, in our opinion, undesirable, photographers ought not to have it even suggested to them that they are doing spying work with their cameras, whereas the term "hand-cameras" meets every requirement. Of course the smaller cameras advertised to be worn on the person are merely toys. The camera we should like to see introduced would be a very light collapsible camera, which could be easily carried in the pocket when not in use. It should be able to take pictures not larger than four and a half by three and a half inches, and should be fitted with the Eastman spools,

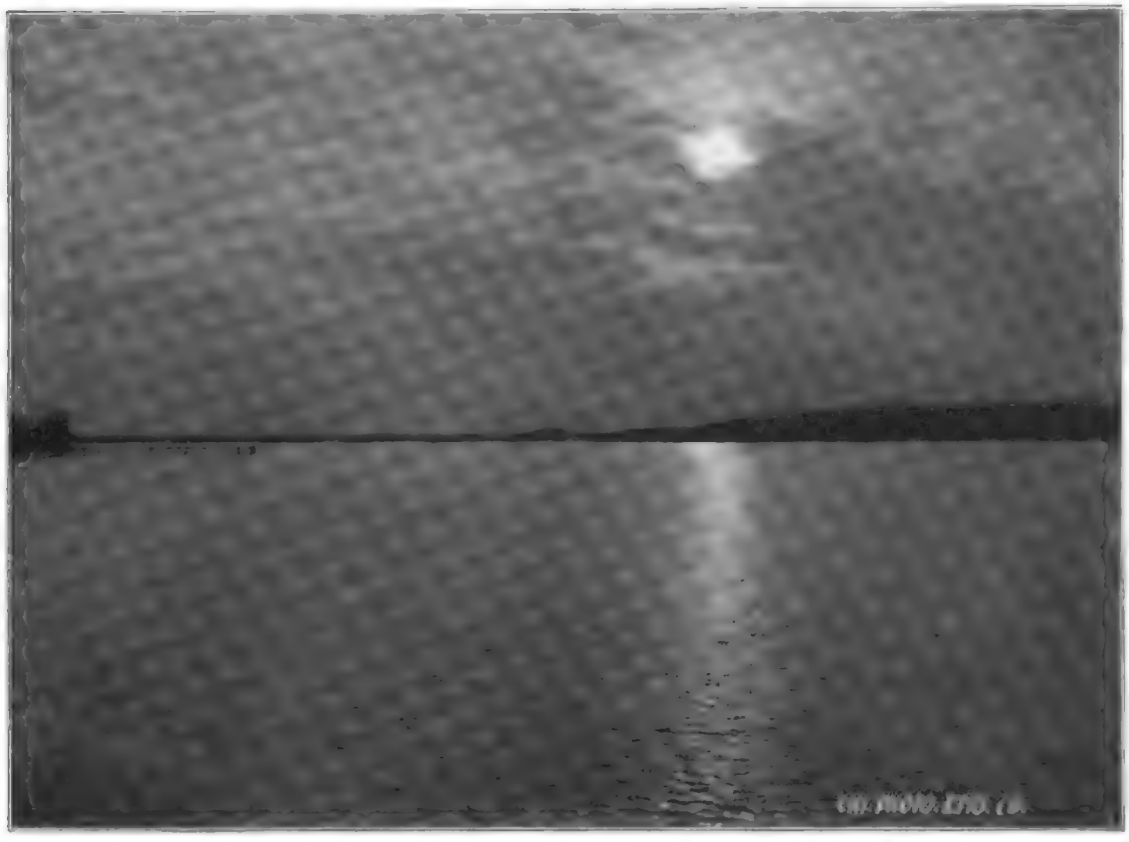
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so that any number of exposures could be made. The lens should be a quick acting long focus rectilinear lens, fitted with a good shutter. There should be a light view meter attached to the top. There is no necessity for a ground-glass screen, for on the tail-board could be registered various distances, at which the film is in focus; and since for pictorial purposes most of the studies would be of objects near at hand, this arrangement would be effectual. The larger cameras can at times be used as hand cameras. We have repeatedly used a 12 x 10 camera as hand camera, but for the particular work required a small light, quickly prepared instrument is required.

The handiest view meter I have used is a square frame fitted to the front of the camera with another frame behind with an eye piece, both centered so that the front frame includes the same position as the ground-glass screen.

When in the country the operator may break his focusing screen. If such an accident happens, he can use as a substitute one or other of the following screens: Expose an ordinary dry plate to the light for a second and develop it in the ordinary way until it shows a uniform grayness, then fix and dry. Another way is to cover a glass plate with a thin layer of starch or olive oil, or a piece of oiled paper or a wet cambric hankerchief stretched across the frame will answer.

(To be continued.)



MOONLIGHT WATERS BY FRED CASADY

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THE STONE BREAKER

BY FERDINAND COSTE

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COMPOSITION. BY G. DAVISON

II.

It is sometimes argued that, inasmuch as photography must take "things as they are," therefore composition and design are not possible to it. In the present writer's opinion, this contention is wrong in its main statement of fact about photography, and at the same time ignores the actualities of much of the best work in painting and drawing art.

If the attitude of the landscape and portrait artist towards his work be considered, and if the results obtained be compared with one's own sight of the subject selected or with the similar work of some other artist, it will be seen that the term "things as they are" is a very loose one and indefinable. There is plenty of room for every different pair of eyes seeing "things as they are" quite differently. There is, indeed, no standard by which such matters can be tested.

The implication, of course, is that the eye of the camera cannot be made to see as the human eye does, or rather cannot be made to alter form and actual and relative tone as the mind may direct.

But that photography does see, and can be made to see as the eyes does, is proved by the characteristic styles and individuality of certain photographers' work. There is immense variety in the impressions of different people, and photographers know that they can secure and reproduce something of the feeling of a striking impression.

That it is impossible in photography to materially alter the form and actual disposition of natural objects in landscape is not all a disadvantage, and is made a great deal more of than the imitation warrants.

The photographer simply has to be more critical in his selection of an example perfect to his taste. It is very conveniently overlooked that many fine painters make no pretense of doing other than imitating their subject. And here it is necessary to remind photographers that imitation must not be taken in its degraded sense of mechanical transcribing.

The first essential in landscape work is natural sentiment. Academic beauty of line, so called, or arrangement of line and mass, though important, are subordinate. Indeed it seems that much prominence given to decorative designing always robs a landscape work of some of its natural effect. The man who in his work marries both qualities of naturalness and decorative arrangement happily and with "the accidental look" is a rare product.

If there were but a few unchanging subjects to select from, the painter of landscape would be in almost as sorry a plight as the photographer. But with an infinite number of subjects undergoing constant and innumerable changes to choose and compose from, alterations of details of form in landscape are not essential and the photographer's limitations should rest easily upon him.



EXAMPLE I.

The same remarks apply more fully with respect to alterations of relative tone. The control is quite sufficient for rendering natural appearances as far as black and white can make an illusion, and if it be held deficient for the requirements of the more distinctly decorative composition or pattern-making, this but encourages more exclusive exploiting of its characteristic truth and naturalness of appearance in subjects with distinctive sentiment,

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EXAMPLE II.

look in his productions. In short, what photography lacks in local control over relative definition, tone and relation of lines and masses, it makes up to a great extent in natural sentiment, and this in landscape comes overwhelmingly first.

It is usual to attempt to divide composition into line arrangement and light and shade arrangement. Line arrangement is then classified into certain shapes of general contours such as circular and pyramidal disposition of objects, whilst light and shade effect is sought to be explained by reference to certain ideas of balance, unity, repetition and the like. This may be well as an introduction to the subject, and may help to save a student from gross awkwardness of design, but it will not carry very far. Such considerations are not laws or rules, for they may be deduced endlessly from the study of actual examples. An original striking composition is generally very difficult to analyse. The pleasure in the pattern is so intimately yet subtly part of the pleasure in the subject and its natural sentiment, that any attempt at dissection is hopeless and inadvisable. It is a matter of feeling, the cause of which defies classification or analysis into line and shade light arrangements.

with the possibility of pleasing and harmonious lines, and with absence of any jarring or awk ward element.

In every art method the worker must train and practice himself in learning its limitations and powers, what it will give him of what he sees, what it will leave out or miss or can be made to select. There is as much selection and composition in shifting to right or left, up or down, to make the relative arrangement of lines come according to design as in altering them on paper to look right. The final result is the test. There is no difference in principle between selecting an impression in one sight satisfactory to the mind and making one up from several sketches.

The influence of photography seems to tend more and more to drive the artistic draughtsman into fanciful work subtly suggestive rather than frankly natural, and into caricature and decorative designing, for all of which, in these complex times, there is increasing room and scope.

Still the artist must always come back and back to nature, and the photographer may rather glory in the limitations which perhaps discourage very distant excursions from natural beauty and effect, and ensure the qualities of truth of general appearance and of accidental

Whilst, however, it is impossible to docket and ticket the grounds for æsthetic pleasure in the greatest works, it is not difficult to point out glaring faults of want of harmony, frustrated intention, absence or confusion of motive, spottiness and awkward jarring disposition of lines, masses or objects in many elementary efforts.

Taking advantage of such examples as are available at the moment, it is proposed to give

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some brief notes upon a few photographs, reproductions of which appear with this article. It is perhaps necessary to add that the points which it is possible to condemn or praise in a direct print may not always show with the same effect in a half-tone reproduction.

Such interest as attaches to the first illustration, a ploughing scene, is that which is generally aroused in the picturesque type rather than in any rarity of effect or feeling or in any distinctive decorative composition. By picturesque type is meant the class or classes of subject that seem to be generally and popularly recognized as having a prettiness or quaintness of their own, such as the faces of weatherbeaten old men or of pretty women, mossgrown old-fashioned cottages, ruined castles, and so on. The happy contrast of the white and black horses in this subject, both excellent types, old and worn with labor, the furrowed ground and the ivy-clad trees supply a set of objects picturesque in themselves, but very little has been done to give the feeling of an artistic presentment, and the subject is awkwardly placed within the limits of the picture. The animals are, it is true, posed with the more picturesque one most in evidence and the white one relieved upon the black. They are also in the line of the furrow as they would naturally come after the turn at the end. They are not, as the writer has sometimes seen, see-sawed about all over the field, where they would or should never be, just for the sake of some mistaken design. The breeze blows the horses' manes, and the boy and man make a sufficiently pyramidal group, too evidently on purpose, but there is very little of the most characteristic features of a ploughing scene and too much of the made-up grouping of the accessories excellent in themselves but devoid of unity of purpose and spirited action.

One of the conditions is that of a bright and breezy day, but in some respects there is very little illusion of bright daylight. In the white horse and other high-lights, the modelling, which should show right up to the highest white is very defective, giving a bald chalky appearance accentuated by the similar want of gradation in the sootiness of the deepest darks, a black never seen outdoors in the open under such circumstances. A longer exposure, preliminary or supplementary sunning down of the printing surface, or special preparation of the sensitized paper might any one of them have been used to mitigate the fault.



EXAMPLE III.

One of the most glaring falsities in the picture is the way in which the tree trunks and branches stood out against the background of scenery and sky. No one ever saw a tree stem in bright light, however dark its green, show against blue sky or cloudy sky with the harshness and cutting separation shown in the direct print now under examination. The green is too dark, the sky too light. Different development even to a slight trace of fog in the plate or different exposure or double printing might any one have mended or mitigated the evil, but orthochromatic plates would in such a case probably have been of little service.

The writer has heard a critic object to the tree growing out of the back of the white horse and it requires very little perception to see that, such as the subject is, it would have been better to have brought the team further from the background of trees, which would thus have been softened down and made less aggressive by the interposition of atmosphere and defect of definition. In that case, too, it would

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have been easier to have sacrificed the tops of the trees in order to provide the added foreground requisite to get the subject solidly and pleasantly placed within the limits of the picture.

Another photograph of the same scene giving a better arrangement of the parts of the subject is reproduced for comparison. It shows the effect of a light alteration in point of view and in disposition of the proportions of the plate.

In the third illustration, the photograph of Mapledurham Mill, some of the same remarks apply. The intention conveyed is that of a desire to portray a pretty scene in a conventionally correct manner. The main masses are too much of the same value and are rather too symmetrically disposed, and there is too great a crowd of equal detail tending to spottiness and to want of concentration and relief. A broader treatment under a less perpendicular lighting would have produced a better feeling and effect. As it is, to represent the sunlight, the shadows of the trees should in most parts be lighter, the sky darker, and several parts of the picture should be sunned down, particularly the light bank on the right. It may be taken as a typical pretty view rather than as a strong subject or composition.

In the fourth and last illustration there is something more distinctive as a composition There is uppermost a feeling of the wildness and weirdness of late and lurid sunlight, an effect of grouped laborers and animals leaving work and seen in the fantastic guise given by low sunshine throwing long shadows towards the observer. It would be easy to criticise local defects and faults of arrangement and tonality, but the picture as a whole may be left to speak for itself as having some strength and distinctive sentiment, and so not unworthy the name of composition.



EXAMPLE IV.

SCIENCE AND ART. BY MARIO DEI FIORI.

In number 23 of the *Amateur of Photography*, Signor Fiocca Novi, an undoubted fanatic of science, strenuously denies that art has any influence on photography; and, considering only the physical and chemical phenomena of photographic reproduction, locks up his dark room in the recesses of his laboratory, as though fearful that the arts of painting and drawing should intrude into it and disturb the regularity of its laws.

Photography, considered in the abstract, in its processes subordinated to formulas, to exact scientific rules, is without doubt a science; but the ways in which it is applied, the ends for which it is used, the results obtained from it may transform it from a science into an art.

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When the end is artistic, the process of reproduction, the lens, the development, the plate, are of no importance; the subject, the accessories, the lighting, absorb all our attention. The painter looks upon the photographic apparatus that stands in his studio simply as a means of carrying out his intent, precisely as he does his pencils, his colors, his glasses, if he is long-sighted; all objects with which physics and chemistry are doubtless more or less concerned, but which have absolutely no importance with regard to the result. This is entirely pictorial: science has disappeared.

And by what name, if not *artistic intuition*, could we designate the judgment which guides the photographer in his research, in his choice of a landscape, or of the movement in a model? Is it, perhaps, the same that rules the agronomist in the reproduction of infected leaves or of insects; the topographer in the making out of a geodetic plan; the naturalist in the enlargement of a microbe; the doctor in the working out of a pathological case?

No one doubts, I repeat, that the process of photography is absolutely scientific; nor that we owe to science all the means that have conspired to the perfection which this art has now attained. Science, too, tempered the sculptor's chisel and prepared the painter's colors. But we cannot possibly deny that a photographic production, sought and obtained by an artist, bears the impress of its author's intelligence and is a clear manifestation of art. Let there, however, be no confusion here. When I say *artist*, I am not thinking of one of the numberless crowd affected by the rage for photography, who, dazzled by the easy and fascinating results to be obtained from the *camera obscuro*, turn a relentless lens at haphazard on the first group of houses that presents itself, or on their servants and relations: victims of the craze. But I am thinking of those who really possess a certain feeling for art; who know how to appreciate, choose, compose a landscape or an action. For, taking a landscape as an example, every one knows that the result will vary according to the lighting, to the season, to the point of view. Nay, it is evident that from the same subject we may, by varying the circumstances, obtain numberless results, more or less artistic, in which neither the worth of the lens, the qualities of the plates, nor the method of development will play any part whatever.

All very well, says Signor Fiocca Novi, but this is simply a question of taste. And what else is good taste, I reply, but a more or less lively feeling for the beautiful, a consciousness of those limits which Horace has pointed out to him who would roam the celestial fields of art?

And we may say the same of a living model. Shall we not obtain many images, of varying artistic value, according as we take her from a better or a worse point of view, as we give her one movement or another, one dress or another? And will not these images be the same whether we obtain them with an old-fashioned machine of thirty years ago, or with the most recent, highly perfected apparatus?

In France, more than elsewhere, have painters for some time past taken the *camera obscura* out of the hands of scientific men. They have made use of it in their art, correcting many errors into which former artists, however admirable in design, had fallen; surmounting many difficulties, and entering on the road of that true realism which, overshadowed by the graces of art, is the perfection of painting. Now, how could this have happened if the *camera* had been used only by scientific men and not at all by artists?

Nay, I maintain that if there is no artistic sense in the man who makes use of the photographic *camera* in its most important mission as guardian of the arts of design, he will not be able, except by chance, to obtain results of any artistic value. Without knowledge of perspective, of chiaroscuro, of drawing in general, he he will inevitably produce matter fit only for the rubbish-heap.

Still further; certain scientific illustrations, certain reproductions, require a fair knowledge of drawing in the operator, if he is to bring out the conformation and the more important details of the subject, according to its illumination and position.

But, objects Signor Fiocca Novi, when you arrange the lights and shades on your subject in one way rather than in another, you do but make use of physical laws; inasmuch as the light and the shadows give character to the face, which in its turn obliges you to know the physical science, anatomy; and you apply mathematical laws, for the intensity of light will be squared a certain number of times, etc.

The fact is, that with this scientific fanaticism of his the contributors to the *Amateur of Photography* would deny artistic feeling even to the painter: would deny that on the choice and the disposition of the subject and of the accessories depends the value of a picture. Worse still;

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FIG. 1.

he opines that the painter's feeling for the beautiful resides in his brush. One would say he was joking. Be the brush of camel's hair or of pig's bristles, the painter's feeling for the beautiful resides in his own soul. And he shows it in every moment of his life: in his speech, in his dress, in his dispositions, in his compositions, in his painting, in his use of the photographic apparatus; this last being to him, as we have already said, simply a pencil directed by his mind; a pencil sometimes more faithful, always more expeditious, precious, therefore, in this hasty, feverish life of ours, in which we must do many things in the shortest possible space of time.

But matters do not end here. The photographer, says Novi, is altogether absorbed by the science of his apparatus, by the calculation required for the photographic processes. According to him the subject springs up before you without your feeling any desire to look for it, and you turn your lens on it as it goes by, just as a cannoneer, safely sheltered on shore, strikes the enemy's ship by means of the calculations of the telemeter; you turn your lens on it, quite taken up by the three facts of the angle of your rectilinear, apochromatic objective, of your extra rapid bromide of silver plates, of the quick action of your shutter. Nonsense! The artist is not making scientific researches or experiments. He cares nothing for fine names: leaves Signor Novi in undisturbed possession of them. He makes a practical use of his apparatus, and uncovers his lens with his mind fixed on his goal; in the same way that he is not at all absorbed, nor even in the very least disturbed, by the mixing of his colors on his pallet, or the washing of his brushes in turpentine.

And if Carlo Brogi, if Michele Schemboche, produce likenesses that have indisputable artistic qualities, they do so not by virtue of their improved apparatus but of their own intelligence: just as it is not by virtue of the *cameras* that among the characterless, innumerable products of the photographic apparatus, we here and there find picturesque studies that are of real service to art.



FIG. 3.

Showing how the same subject may give different results according to the point it is taken from.



FIG. 2.

Moreover, there is no question of degree between science and art, as Signor Novi would have us believe. Neither ranks above the other in the economy of human knowledge; nor does photography gain added luster from being placed in one realm rather than in the other.

To conclude. Photography is a science or an art, according to the goal it would reach. Just as geometry, a science in itself, a science in

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the calculations of geodesy and astronomy, becomes an art through the genius of the architect: a science with Newton, an art with Buonarroti; just as acoustics is a chapter of physics, science in the phonograph, art in the piano; so photography is a science with the scientist and an art with the artist: science with Fox Talbot, art with Michele Gordiziani, with Vinea, with Michetti.

"AN IDEAL PRINTING PAPER." BY MAXIMILIAN TOCH.

In the May number of the PHOTOGRAPHIC TIMES I perused with much gratification the article by J. Horace McFarland, entitled, "A Convenient and Rapid Printing Process," and while I agree in every particular with the opinion given, I wish to add my quota, which if possible, is simpler than the methods described.

Velox Carbon is called the paper of the future, and as I have used every paper ever put on the market I abandoned them all, even the use of Platinum, for it. I expose Velox Carbon to an ordinary 16 candle power gas flame for thirty seconds, about ten inches away from the flame, and keep the printing frame moving all the time so as to get a uniform impression. I then take the paper face up and put it in a wet tray, and paint the film side with a mixture of

Amidol	60 grains.
Sodium sulphite	1 ounce.
Water	16 ounces.
Potassium Bromide	1 grain.

All this I do by the same light about ten feet away from the gas, and sometimes I have a candle burning a foot away from the tray. The picture comes up instantly, and after noting that it is uniform, for if it be not entirely uniform, I keep brushing the developer on the uneven parts, I plunge it face down in the acid hypo bath, and keep it moving for a few seconds, and the operation with the exception of subsequent washing and mounting is done. The developer I use gives intense blue black prints, in every respect equal to Platinum. Two things are necessary for absolute success with Velox Carbon; first, the use of distilled water; second, cleanliness. It is necessary to become ambidextrous in order to have good results. I use the right hand for handling the paper, and for brushing on the developer, and I use my left hand for moving the print in the hypo. I drop the print with the right hand into the hypo, and then use the left hand for plunging and continued motion, after which I wash the left hand in a small dish of acidified water, and go on with the next. The whole process becomes mechanical in a short time, and the resulting prints are all that can be wished for. Sometimes I make over three dozen an evening, and although the makers do not advocate extensive washing, I find that where the acid hypo bath contains plenty of alum and is fresh, the prints do not suffer from being in the water all night. The glossy Velox is admirable for those who like glossy prints. I have used it to some extent but I prefer the Velox Carbon.



SIEGFRIED "THE CHALLENGE" BY W. H. WALKER

Many operators depend upon development as a means of securing brilliant negatives. This, though in itself a good method, cannot be called a legitimate one. Brilliancy should be secured by a correct disposition of the light during sitting. Contrasts produce brilliancy, but they must be delicately managed or the result will be harsh.—*Richard Penlake.*

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PHOTOGRAPHY IN COLORS BY IRIDESCENCE. THE WORK OF LIPPMANN, HIS PREDECESSORS AND HIS FOLLOWERS.

BY THOMAS BOLAS, F.C.S., F.I.C.

THE production of photographs in colors by what is now generally known as the interference method dates back to the earliest days of photography, and progress is being made almost month by month at the present time. Indeed, it is very easy to obtain photographs in very striking and well-marked colors, but the correspondence of the colors with those of the original object has not yet been such as to fully satisfy the technical expert or the trained artist, provided that the original object was a fair test of many tints each in numerous gradations, gradations of monochrome being, of course, included.

Work done in the pre-photographic period (about 1810) by Seebeck may be alluded to in passing, and that versatile genius, Goethe, describes Seebeck's experiments, which he appears to have witnessed. A paper prepared with chloride of silver was exposed to the spectrum, and where acted on by violet light it became reddish brown, ultimately tending to violet or blue. Under the blue rays the paper took a brighter blue tint, and in the red and ultra-red it became reddish.

The earliest work done under conditions now generally recognized as favorable was by the first Niepce between 1822 and 1829; these favorable conditions being a very thin transparent and structureless film of sensitive material in optical contact with a bright metallic reflecting surface. The first Niepce used thin films of sensitive bitumen, and he specially mentions silver plated on copper as best adapted for reproducing images, although he occasionally used glass; upon which medium something more than merely suggestive interference effects can be obtained without the use of any other reflector than the glass itself, provided that the sensitive film has a refractive index somewhat different from that of the glass. Specimens of the early work of the first Niepce which I have seen show iridescent colors which seemed undoubtedly to have some measure of approximation to the tints of the original subject; while a thoroughly authentic document written by Niepce, and dated December 5th, 1829—or ten years before the announcement of the Daguerreotype—details the results of exposing a glass plate coated with bitumen in the camera. Niepce says: "If this landscape be viewed by reflection in a mirror, on the varnished side, and at a certain angle, the effect is striking, while, seen by transmission, it presents only confused and shapeless imagery; but what is really surprising, in this position the mimic tracery seems to assume the local colors of certain objects." Niepce theorizes on the subject and compares the colors to those of Newton's rings.

After the discovery of the Daguerreotype process it was found that by forming a film of chloride or sub-chloride of silver of exquisite tenacity on a polished silver plate, heliochromes of considerable fidelity to nature could be produced in the camera; this discovery being the result of numerous experiments commenced by M. Ed. Becquerel (1848), and continued by the second Niepce, Poitevin, St. Florent, and others; but owing to the fact that no satisfactory method was found of fixing such heliochromes, but little public attention was given to the matter. It must not be forgotten that a film of chloride or sub-chloride of silver formed by chemical action on a silver plate is not a layer of agglomerated flocks like the precipitated compound, but if thin is a transparent and scarcely visible film.

The following instructions will enable any person accustomed to physical manipulations to prepare a heliochrome—unfortunately unfixed—by the interference method as evolved by the labors of the three investigators just named: A carefully cleaned Daguerreotype plate is heated to about the temperature of melting lead in order to drive off anything condensed on the surface. When cold it is made the anode in an electrolytic bath containing one volume of hydrochloric acid to eight of water, the cathode being a platinum wire which should be about four inches from the silver surface, and should be kept moving in a plane parallel to the silver surface. Three small cells of Groves', Bunsen's, or bichromate battery may be used, and the action should continue until a voltameter placed in circuit shows the liberation of half a cubic centimetre of hydrogen for each square inch of surface to be made sensitive. The plate being now washed and dried, may be exposed at once, but if kept at a temperature of from 35 deg. C. to 40 deg C. for a week, or rather more, the film hardens and better results are obtained. Exposed in the camera, or in a printing frame under a colored transparency, such a plate gradually becomes tinged with the colors of the original, and the progress of the operation may be watched in a

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feeble light, which ought not to exceed that of a candle flame at a distance of, say, four feet.

Similar results have been obtained on paper, but the conditions are less favorable and not so certain.

What is now generally admitted to be the true theory of such results as those described above was put forward very clearly by Lord Rayleigh in the *Philosophical Magazine* for March, 1887. He represents the film during exposure as being subjected to stationary luminous waves of approximately definite wave-length, the effect of these being to impress upon the substance a periodic structure recurring at intervals equal to half the wave-length of the light.



THE TOW BY E. E. MAINWARING

Four years later (February, 1891), while Professor Lippmann was making experiments based upon this theory, a *Daily News* correspondent in Paris now astonished the world by the publication of an absurdly and grotesquely exaggerated account of his work, the account being headed "Photographing in Colors." This was the commencement of much newspaper writing, and Lippmann's name became a household word. The *Daily News* correspondent described the colors obtained by Professor Lippmann as equal in brilliancy to those of a finely cut Golconda diamond," while M. L. Vidal, writing at his time of one of Professor Lippmann's spectrum reproductions, says: "On examining it carefully, and making the little plate yield reflected images in different directions, we finally perceived a sort of iridescence in those parts where we are told the spectral images existed, and we should never have suspected, if we had not been told of it, that it was a reproduction of the solar spectrum with the colors. Viewed as a transparency, the plate showed a reddish stain in the part corresponding to the middle of the spectrum. Theoretically, we ought to see as a transparency colors complementary to those seen by reflected light."

At this stage M. Lippmann had made two important advances, which advances led to further work, and may ultimately lead to something which an expert colorist might reasonably call photography in colors by the interference method. In exposing a nearly transparent film on a glass support he used mercury in contact with the film as a reflecting surface, and he also emphasized the hitherto almost unrecognized fact that the colored effects on organic films containing silver may be fixed with hyposulphite of soda. He also established beyond doubt that there is at any rate some degree of connection between the colored light impinging on suitable films and the iridescent tints produced. I believe, however, that nothing exhibited by Lippmann during the twelve months following the announcement in the *Daily News* could, except by the greatest stretch of the imagination, be called a photograph in natural colors. In the case of a spectrum reproduction shown at a meeting of the (now Royal) Photographic Society in London, but few of the tints of the spectrum could be in any sense recognized, and these did not occupy the correct relative positions. In the *Times* of July 7th, 1892, Mr. Cameron Swan gives a long and carefully critical account of six of the Lippmann results as shown at an exhibition of photographs then in the Champ de Mars at Paris. In no case was the object photographed shown alongside the reproduction, and in no case was there any reason to conjecture that the colors of the original were more than very approximately reproduced. The following extracts may be given from Mr.

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Cameron Swan's description of the photograph of a stuffed parrot: "Perched on what appears to be a photographer's iron head-rest, the rods of which have come out in blue in some parts, shading into red on others, but with black high lights, and where the tail of the parrot and the vertical column of the head-rest are parallel, the coloring is alike, both shading off from blue above to red below."

The work of Lippmann has borne fruit more especially by causing others to labor in the same field—very notably Herr Valenta, who has obtained and exhibited reproductions of the spectrum in which there is such sequence of the tints as to carry immediate conviction that there must be some basic truth underlying interference heliochromy, although the boundaries of the respective tints shift considerably if the angle of view is slightly changed.

Still further progress has been made by the Lumière brothers, notably M. Louis Lumière, who made a special thin and transparent emulsion of bromide of silver in gelatine with which glass plates were very thinly coated, and partly orthochromatized by the usual agents.

The film was now made more sensitive by a weak bath of acidified nitrate of silver, and five or ten minutes in the camera sufficed to give an impression which on development with a pyrogallic developer, and fixation with weak cyanide of potassium, gave a colored reproduction of nature, in which the tints were far more than merely suggestive. Indeed, the brothers Lumière appear to be those who have made the most considerable advance in connection with interference heliochromy; but even at this date nothing has been produced which an artist, a casual purchaser of prints, or indeed anyone not carried away by enthusiasm, would be likely to regard as a photograph in natural colors.

Professor Lippmann has done excellent service, and apart from his work in connectiou with heliochromy he is a man of the first eminence in the scientific world; hence he thoroughly deserves all honor which may be done him in connection with heliochromy. Still, the labors of others must not be forgotten, especially those of the first Niepce, who laid the foundation, and of the Lumière brothers, whose modes of working bring us nearest to the practical realization of interference heliochromy—a point already reached by three-color heliochromy.—*The Amateur Photographer.*

THE CHEMISTRY OF SOME THE MORE COMMON PROCESSES OF PHOTOGRAPHY.—BY MR. H. C. L. BLOXAM.*

When asked some time ago to give a lecture on the chemistry of photography I agreed to do so, but on consideration found this rather a "large order," because the chemistry underlying any one process of photography could not be dealt with in less than two or three lectures at the very least; so that to-night I propose to speak upon the action of light upon chemical compounds, and particularly those compounds with which you, as photographers, have to deal most commonly. And inasmuch as you deal, perhaps, more commonly with silver salts, I propose to give these the least consideration, for one reason, on account of the fact that once I began to go into the action of light upon silver chloride, I should involve myself in a turmoil of discussion.

The photographer, dealing as he is more particularly with silver compounds, is apt to overlook the fact that light has a very powerful effect upon numbers of other chemical bodies. In the stores attached to the chemical department of any institution one thing that strikes you is the large number of colored bottles in which substances are kept, and the first question that arises is, what is the value of the colored glass? Of course, the answer is this, that so many bodies are acted upon by light that it is absolutely essential to guard those substances against the action of the actinic rays, and in order to do that, in a measure, one puts the sensitive substances in bottles made of colored glass. Another thing that strikes one in going into a laboratory is the fact that a bottle of chlorine water, which should be green, is usually colorless; the reason for that is that light acts upon a solution of chlorine in water and so produces a photo-chemical change, as it may be called. Here is such a solution, a solution with a brilliant green color, which, since its preparation, has been kept in the dark; here is another solution made at the same time, but which has been exposed to the light in the laboratory: you see the difference, in the latter the photo-chemical change has taken place, with the disappearance of the chlorine in the free state which gives the green color to the chlorine water. I have here two sealed tubes made at the same time, and they contain the

* Read before The London Camera Club.

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organic body known as ethyl iodide, a substance which is particularly sensitive to light, and you will find that one of them is colorless whilst the other is deeply dyed brown. The only difference in the tubes is that the one has been exposed to light, whilst the other has not; so that here again we have the action of light influencing a chemical body and submitting it to a process of decomposition. A substance with which you are very familiar is potassium iodide, as you all know a solution of potassium iodide when first prepared is colorless, but on exposure to light in a well lighted room the solution becomes tinged with yellow. That is partly due to the action of light, and also to the action of atmospheric air, which is accelerated by light.

I have given these few instances to show you that a number of substances are acted upon by light, and in order to show you that light acts upon bodies other than those with which you have to deal in photographic work.

In order to guard against this photo-chemical action of light, one encloses these substances in bottles of colored glass, or they are kept in a dark room or cupboard which is almost hermetically closed and painted black internally.

Light acts upon chemical bodies or chemical compounds, one may say roughly, with the production of two kinds of changes, in the first case in the production of a purely physical change, and in the second case in the proportion of a chemical change. We must not draw too hard and fast a line between the two classes of actions, because it is very difficult to say where the one ends and the other begins, and in certain cases one may have both proceeding at the same time. We will first consider a few instances of physical changes brought about by light. There is an evil smelling substance known as carbon disulphide; a week ago I saturated some carbon disulphide with sulphur, and I put the solution so prepared in these two sealed tubes, and shut up one in the darkened cupboard and exposed the other freely to such sunlight as we have lately had in London. You see a very curious action has taken place, and the effect is this,—that the solution which was protected from light remains clear, whilst in the other sulphur has been deposited on the interior of the tube. The question is, how can we say that that is a physical change? It is a physical change because the only difference between the sulphur in the clear solution and the sulphur which is deposited in the other, is that in the latter the sulphur is insoluble in carbon disulphide, and is therefore an entirely different substance physically from the sulphur which is dissolved in the carbon disulphide. We say, here that the light has produced an action upon the sulphur, and has thrown down an allotropic form of sulphur. The production of an allotrope



THE TOWER BRIDGE BY E. E. MAINWARING

of sulphur is simply a physical change, so that you see the light has produced upon the solution of sulphur in carbon disulphide a physical change.

I have in these two tubes some phosphorus under the surface of water; the phosphorus in one tube has not been exposed, whilst that in the other has been freely exposed to light for years. A very great change has been produced upon the phosphorus so exposed, and the effect has been to convert the yellow variety of phosphorus into its allotropic modification—red, or amorphous phosphorus; you will see the yellow phosphorus is built up of beautiful crystalline masses, whereas that in the other tube is in the amorphous or uncrystalline condition. The production of an allotrope is a

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purely physical phenomenon, so that the light in these two instances has produced a physical change.

We pass now to the consideration of a subject which will be of greater interest to you—the *chemical action* produced or induced by light upon chemical compounds. I propose first to deal with the action of light upon iron compounds; but before passing to the consideration of any particular instance, I want to point out that photo-chemical action of light upon compounds may be either reduction or oxidation. What do we understand by *oxidation*? A substance is usually said to oxidize when it combines with oxygen, and a substance is said to be reduced when oxygen is withdrawn from it, but by the photographer and the chemist oxidation and reduction have to be interpreted in a wider sense than this. Let us take the case of iron and its combinations with chlorine. As you know, iron forms two compounds with chlorine, one called ferric chloride, having the formula Fe_2Cl_6, whilst the other is called ferrous chloride, and has the formula Fe_2Cl_4. Supposing we take away chlorine from the *ferric* compound it will be converted into *ferrous*, Fe_2Cl_4, and we say from a chemical point of view that we have reduced the substance. Supposing we take *ferrous* chloride and add chlorine, or make it combine with chlorine, we produce Fe_2Cl_6, and we say that this compound is an oxidation product of Fe_2Cl_4. Now we see that oxidation and reduction must be interpreted in a very much wider sense than the mere addition or removal of oxygen; in fact, we may define oxidation as the combination of a body not only with oxygen, but with a larger quantity of chlorine or similar non metallic elements; and, conversely, reduction means the removal of oxygen, or of some similar element such as chlorine or sulphur, from a substance.

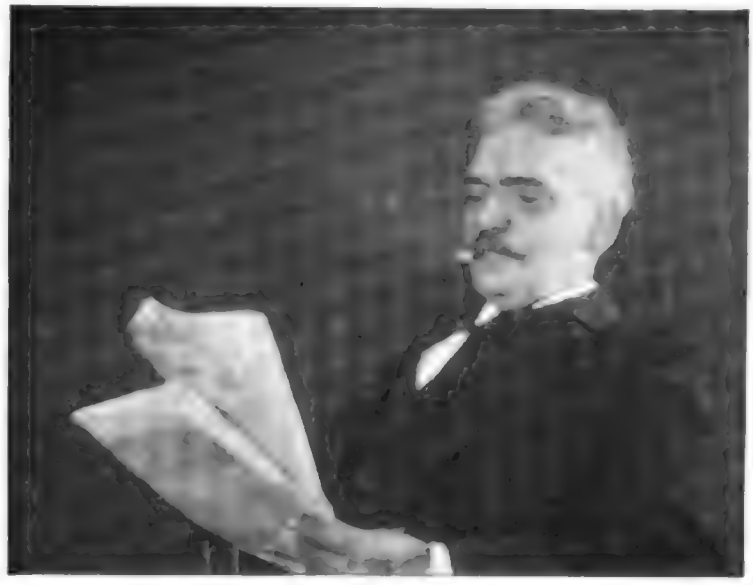
Now, inasmuch as we shall be concerned with the peculiar re-actions of ferric and ferrous compounds, I propose to show you how we recognize the two. In this beaker I have a solution of ferric chloride, and I will add a little potassium ferricyanide (red prussiate) in solution to that compound, and you will find that a deep brownish coloration will be produced, but no precipitate. Now I am going to withdraw chlorine from the ferric chloride, in other words, to reduce it by adding a solution of sulphurous acid, ferrous chloride resulting, and you will notice that an alteration of the color takes place. In order to make it perfectly apparent to you I am going to add some of the same solution of red prussiate to the reduced solution, and a dense blue precipitate will be produced. The inference is that the ferric compound has been reduced by sulphurous acid, and the experiment shows that reduction not only consists of the withdrawal of oxygen but also of a non-metallic substance like chlorine.

Now I think we have cleared the ground for the consideration of the action of light upon the various compounds of iron, and first we will deal with ferric chloride, Fe_2Cl_6, a substance familiar to photographers as perchloride of iron. Perchloride of iron is soluble in water, and the aqueous solution so prepared may be exposed for any number of years without undergoing any reduction at all. I have such a solution which was prepared five years ago, and which has been exposed during that time to the action of such sunlight as there has been, and you will see there is not a trace of reduced iron in it; that is to say, not a trace of ferrous compound has been formed by the exposure of the solution. In order to test for the ferrous compound we will add red prussiate, and if there be any ferrous compound present the solution will at once strike a deep blue color; the merest trace of iron in the reduced state produces a very large coloration, but I think you will find there is none here. The point is this—that although ferric chloride is reducible there must be some reducing agent or sensitizer present, in order that the iron may be reduced from the ferric to the ferrous condition. Such a reducing substance is alcohol, and if an alcoholic solution of ferric chloride is prepared and exposed to light a very large amount of reduction will take place. I have here an alcoholic solution of ferric chloride prepared at the same time as the aqueous solution and it has been subjected to the same conditions, viz., full exposure to light during a period of five years: I propose to take a little of this ferric chloride (which originally contained no ferrous compound), and on the addition of our test for ferrous iron you will find that a very large amount is present, that is to say, that the solution will strike a blue coloration. So that you see that although the aqueous solution of perchloride of iron is unacted upon by light, the exposure to light of an alcoholic solution, alcohol being a reducing agent, reduces the iron to the ferrous condition, as shown by addition of the red prussiate.

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Another reducing agent is ordinary glazed paper which has been sized. I impregnated this paper with a ten per cent. aqueous solution of ferric chloride, and exposed it under a design, and now propose to develop the image by means of potassium ferricyanide. The ferric chloride on the exposed portion has become reduced by light, whilst the part which was covered by the design is unacted upon; consequently upon developing with potassium ferricyanide solution the exposed portion will be colored blue, due to the formation of "Turnball's blue," whilst the part covered by the design will still be in the ferric condition; so that not only does ferric chloride become reduced in the presence of alcohol, but also in the presence of any organic substance such as the size of an ordinary glazed paper.

Ferric chloride is an inorganic salt of iron, but if we employ an organic salt of iron no sensitizer need be present. In the case of ferric chloride, an inorganic compound, we had to use alcohol or the size of the paper, in order to obtain reduction on exposure to light; but with an organic salt of iron, such as ferric oxalate no third substance need be present, because the organic acid present acts as the reducing agent or sensitizer. Ferric oxalate decomposes on exposure to light, and yields not only ferrous oxalate but also carbonic acid gas or carbon dioxide, which can be readily recognized by the action of the gas upon lime or baryta water. I propose now to pass a beam of light through an aqueous solution of ferric oxalate, which has already been tested and found to contain not a trace of the reduction product, viz. ferrous oxalate, and you will find that upon passing the beam through the solution bubbles of carbonic acid gas will appear. Having seen that is the case, I will now test the solution by adding red prussiate and you will see that the other reduction product—ferrous iron is also present. The conclusion to be drawn is this, that with an organic salt of iron no reducing agent need be present, because the organic acid acts as the sensitizer or reducing agent. In case this experiment failed with the beam of light here, I set it going in sunlight some time ago. This tube was originally filled with ferric oxalate moistened with water, there being absolutely no ferrous iron, and the tube was then placed in a very exposed position, where it received the full influence of sunlight. I made the gas which was evolved pass through a U-tube containing lime water, which is peculiarly sensitive to carbon dioxide, and it formed the precipitate of carbonate of lime, which you see in the tube; so that we have there evidence of the formation of one of the products of decomposition of ferric oxalate.



PORTRAIT STUDY BY E. LEE FERGUSON

In order to leave no loophole unguarded, I prepared another test to show the action of light upon a solution of ferric oxalate. As I pointed out, the two products are carbon dioxide and ferrous oxalate. A solution of ferric oxalate is perfectly clear, because it is freely soluble in water, whilst ferrous oxalate is but sparingly soluble; so that on exposing a solution of ferric oxalate to light the insoluble ferrous oxalate is precipitated, and here you see it coating the sides of the flask.

Another organic salt of iron which is sensitive to light is ammonium ferric citrate, in which the iron becomes reduced to the ferrous state upon exposure. I have here a piece of paper coated with a ten per cent. aqueous solution of ammonium ferric citrate, and exposed under a design, and upon development with potassium ferricyanide the exposed portions will become blue, and the unchanged ferric compound,

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which was protected by the design, will not show at all.

I have taken iron to start with because there are a number of points to be noticed in connection with the action of light upon these compounds of iron. Firstly, you notice that although we may have a chemical compound which is susceptible to the action of light, it is necessary to have some inducing agent in order to allow the action of light to come into play. in other words we must have a sensitizer. Perchloride of iron, we saw, was susceptible to photo-chemical change, but until it was exposed in admixture with alcohol or with the size of paper the light had no influence, in other words, it did not exert any reducing action. Then another thing I wish to point out is this. Here are two bottles, both originally contained ferric oxalate, one is a colorless bottle, and to all appearances, seems to contain nothing else but ferrous oxalate. The moral to be drawn is that a substance which is susceptible to photo-chemical change must be kept in a bottle of dark glass so that the actinic rays may be cut off from the chemical compound and the substance preserved in the form in which it is labelled.

I should have liked, when preparing this lecture, to have had time to study the action of light upon absolutely dry ferric oxalate. I do not know whether anyone has tried whether ferric oxalate is reduced when absolutely dry, but my experiments with a view to establishing that fact failed to produce any amount of carbonic acid gas. It is very important to bear in mind the fact that moisture plays a considerable part in chemical change, and I hope to be able to establish before long whether or no moisture is essential to the reduction of ferric oxalate. It may have been shown before, but I am unable to find any printed records.

I think we have fairly exhausted the action of light upon iron, both in its organic and its inorganic combinations; and I now pass to the consideration of a very important class of salts, viz., the salts of mercury, which, of course, play an important part in intensification and in a number of other ways. I have here some mercury compounds which have been exposed to light, and also some which have not been so exposed. In this tube there is a brilliant yellow substance which is precipitated mercuric oxide, HgO, a substance containing a large percentage of oxygen, and which has been kept in a dark cupboard; the second tube contains HgO which has been subjected to the action of light, and has become perceptibly darkened. This is a rather interesting matter, because as far as I know the action of light upon mercuric oxide has not been studied to any great extent. The action of light upon mercurous oxide, and the products of the light are mercuric oxide and free mercury. This tube originally contained mercurous oxide, and has been exposed to full sunlight during five years; a part of it was protected from the action of light, and the unprotected part has become so reduced as to actually form a mirror of mercury.

A substance familiar to us all—as being a component of the homely "blue pill"—is calomel, or mercurous chloride. Here we have a tube which originally (five years ago) contained mercurous chloride, Hg_2Cl_2, and it was partly screened from light and the lower portion was exposed; you will notice that the exposed portion has become perceptibly darkened, whilst the protected portion is exactly as it was when first put into the tube; the mercurous compound has been converted into mercuric chloride with liberation of mercury, and that has caused this peculiar graying. I pointed out that the chemical changes, induced by the action of light, might be roughly divided into reduction changes and oxidation changes; we have here instances which cannot be included in those two classes.

I want to show an experiment which proves that the mercuric compounds are very readily reduced to the mercurous state. An aqueous solution of mercuric chloride is suspectible to light influence with the production of the mercurous compound, but the mercuric solution is very much more sensitive to light reduction if some reducing agent be present. Such a reducing agent is ammonium oxalate—ammonium oxalate and a solution of mercuric chloride known as Eder's Photometer. I propose to mix equal proportions of the solutions and make a solution of the mercuric compound, and upon placing the flask in the path of a beam of light from the lantern you will find that the solution almost immediately becomes opaque and milky in consequence of the formation of the insoluble mercurous compound. The milkiness is caused by the reduction of the mercuric compound from the mercuric chloride, which is soluble in water, to the mercurous compound which is insoluble; so that the fact that the solution becomes cloudy is an indication that reduction has taken place, showing that mercuric compounds

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must be kept in the dark or in colored bottles.

Just as the ferric compounds are reducible in the presence of reducing agents, so are the cupric compounds of copper so reduced. Supposing, for instance, we take a solution of cupric chloride in alcohol, exposure to light results in the formation of the insoluble cuprous chloride. This reduction takes some considerable time to perform, and I do not propose to show it now; but I have a solution containing cuprous chloride, and I will expose it to light, and you will find that, just as silver chloride or mercurous chloride is darkened by the action of light, so is the cuprous compound darkened. That is an important point to remember, because in the theories deduced to explain the constitution of the product obtained from silver chloride upon exposure, the darkened product has been likened to copper in the cuprous condition and to mercury in the mercurous condition; but, as this experiment will show you, the darkened compound is really comparable with copper in the cuprous condition or mercury in the mercurous condition, and the reduction product is not to be compared with the unchanged compounds, which are white.



THE CANOEIST — L. L. PEDDINGHAUS

One very interesting class of compounds which I should like to deal with for a few minutes are the chromium compounds. Dichromate of potash in aqueous solution does not undergo any change when subjected to the action of light, and in this respect it resembles ferric chloride, which, in the presence of water, undergoes no reduction; but in the presence of organic matter or of some reducing agent dichromate of potash does undergo reduction. I have here a paper coated with bichromate of potash and exposed under a design cut out of black paper, you see where the light has acted upon the prepared surface an alteration has taken place, but where the dichromate of potash was protected from the light no change has occurred. What has happened, in the dichromate of potash the chromium is in the condition of an oxide known as CrO_3; under the influence of light, in the presence of a reducing agent such as the size of the paper, the chromium has undergone reduction and some constituent of the paper has undergone a corresponding oxidation, with the result that the chromium has been reduced to the basic chromium condition which contains less oxygen in proportion to the chromate. The formula for the chromium in the bichromate condition is CrO_3; under the influence of the reducing matter in the paper the compound has undergone reduction to Cr_2O_3, a compound containing less oxygen to each chromium atom. The size is simply an organic body which is capable of undergoing oxidation.

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This is the principle of the chromatized gelatine. I have got a rather good experiment here. I prepared a 2 per cent. solution of gelatine, to which I added a certain proportion of dichromate of potash, this set to a jelly on cooling, and was exposed for about seven days, and the consequence was that a certain proportion of the gelatine became insoluble. As you see here, we have now a jelly in which are suspended a lot of flakes, and when a shadow of it is thrown upon the screen you will find there is a grained appearance indicating the presence of some insoluble matter in the jelly, for if the matter in the test tube were all in solution the light would pass right through it as in the case of the ferric oxalate, the grained appearance caused by the flakes is due to the presence of insoluble matter produced by the action of light upon the chromatized gelatine. As you know, upon exposing such a surface to light the gelatine is rendered insoluble where the light has impinged, and is not removed by washing with water in the subsequent process.

One more point I think I must mention, in spite of the fact that you are thoroughly well familiar with it; and that is the action which light has upon compounds of silver. As you know, most compounds of silver are susceptible to the action of light. Most, I say, because if you make a solution of silver nitrate in absolutely pure water, the vessel containing it being absolutely clean, the silver nitrate undergoes no reduction; but if you make an alcoholic solution of silver nitrate, that solution upon exposure to light does darken, and deposits a black substance upon the bottom of the bottle which may, or may not, be metallic silver.

Silver chloride is, of course, the basis of many photographic processes, and that substance on light exposure undergoes the familiar darkening, due to the liberation of chlorine. In order to prove that chlorine is liberated, I have fitted up a little test. I have exposed some moist silver chloride contained in this tube, and in the tube is suspended a piece of paper impregnated with a solution of potassium iodide and starch, which is a very sensitive test for chlorine, with which it produces a beautiful blue color. I have here such a solution of starch, and in it is dissolved a very small quantity of potassium iodide. I will add to it one drop of chlorine water, and you will find a very beautiful blue color is produced, which is caused by the liberation of the iodine from the potassium iodide. The iodine, then, acts upon the starch, producing the blue color, into the constitution of which we will not enter. To return to the silver chloride and the paper impregnated with potassium, iodide and starch, the fact that the paper, after exposure to light for about an hour, has become blue, shows that chlorine has been given off from the silver chloride, and consequently that the darkened product is a reduction product; something, viz., chlorine, has been taken away from the original silver chloride. It appears curious that chemists have been unable to trace the real action which takes place when the silver halogen compounds are exposed to light. That the darkened product caused by the exposure of silver chloride to light is a reduction product is proved by the experiment I have shown you, but we are unable to say anything definite as to the nature of the reduction product. The real difficulties met with in the researches that have been prosecuted in order to establish the nature of the darkened product are (1) that such a very small quantity of the reduction product is obtainable, and (2) that the attempts to obtain the little of it that is produced have led to its decomposition, so that we have been unable to obtain the substance in the unaltered form as it occurs in the darkened product. There are practically only three alternatives, the reduction may have been carried so far that the silver chloride is reduced to metallic silver, or it may be the mysterious sub chloride is produced, or, again, it may be what is known as an oxy-chloride, *i.e.*, a chloride which contains some oxygen. It seems that the last is the most likely explanation of the composition of the compound. Captain Abney has shown that silver chloride, when perfectly dry and when sealed up in a vacuum, undergoes no change on light exposure; and Hunt has shown that oxygen is essential to the darkening of silver chloride, so that it seems to point to the fact that this darkened product is an oxy-chloride of silver, but as to its exact nature we are still in doubt.

PHOTOGRAPHY BY THE RÖNTGEN RAYS, UP TO DATE. BY HALL-EDWARDS, L. R. C. P.*

When, some two months back, I accepted the kind invitation of your courteous Secretary to appear before you this evening, I am afraid that I allowed my answer to be given by my heart, rather than by my

* Read before The Royal Photographic Society.

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head. Had I properly and sincerely weighed the subject I am certain that I should have answered in the negative, rather than in the affirmative, for, on carefully and impartially reading afresh the masterly paper of Prof. Röntgen, published in January last, I am fain to admit that little light has been thrown upon the subject during the year which has elapsed since the discovery was first made public. In face of the fact that no modern discovery has received so much attention, and that upon no subject has so much been written in so short a time, this admission must appear curious; nevertheless, it is true, and although I am obliged to admit it, I must confess that it is no fault of those who have expended their time and energy in the attempted elucidation of a subject which so far has baffled all inquiries. As far as facts themselves are concerned, I am afraid that I have nothing new to offer you, little or no progress has been made, and no satisfactory theory as to the cause of the phenomena is so far forthcoming. It must not be argued that because some of our photographic friends are sick of the subject, whilst others have worked themselves into a state bordering upon lunacy from the constant viewing of portions of their own and their friends' skeletons, that the X-rays are not worthy of the serious consideration of photographers. On the other hand the fact that application of the X-rays to photography has already proved a help and blessing to mankind, should act as an inducement to further investigation. From the point of view of the ordinary photographer, it must be admitted that the results of experiments have so far been disappointing. In common with a great many others I hoped to obtain great things from the application of X-rays to photography. Why I should have done so I am now unable to say, any more than I am afraid that the wish was father of the thought. I hoped that the X-rays would enable us to throw some light upon the vexed question of the formation of the latent image. So far, however, my experiments have not helped me, but even now there is room for hope. That the action of the X-rays upon a photographic plate is identical in every respect with that of light, I have amply proved, and as regards the finding of a solution to the difficult problem which has ever confronted photographers, I am afraid we are as much in the dark as ever. During the progress of the early experiments with X-rays, it was confidently stated that their photographic action was due to the fluorescence of the support upon which the sensitive film rested; and in support of this statement it was averred that the exposed films developed from the back, and that no image could be produced upon a film which was not backed by a fluorescent medium. Unfortunately this statement (like a good many others) is easily proved to be untrue. Photographic plates exposed to the X-rays do not develop from the back, and moreover negatives can with ease be produced, the films of which are not supported upon any visibly fluorescent substance.

The fact that films which have been exposed to the action of the X-rays develop from the exposed side, is to my mind a most important and interesting point; for whilst it is possible to produce several negatives at one exposure (proving that the rays have completely passed through each of them), it is easily demonstrated that one and all develop from the surface which has been exposed nearest to the tube.

If a plate be exposed to ordinary light in a camera, an exactly similar result is produced. Now as in both instances the actinic rays must pass completely through the film it would appear that the result produced is due to some peculiar action in the film itself, and that the molecules which have been acted upon must in some mysterious way protect those beneath them. That this is not the case, however, is patent from the fact that a second film, placed beneath the first, is only protected from the X-rays to the extent of the opaqueness of the support upon which the film is spread. We shall, therefore, have to look for another cause for this curious effect.

During my experiments I have tried almost every plate upon the market, and the experiments lead me to conclude that (if the best results are to be obtained) thickness of film is of a greater importance than rapidity. I am now generally using a plate which (as plates go) would be considered slow, but which at the same time is rich in silver, and thickly coated. The exposures are much longer than some I have seen quoted, but the negatives produced are capable of yielding first class prints without intensification.

Some short time back the chief object in life appeared to be that of obtaining an X-ray negative in the shortest possible space of time. The length of exposure necessary to produce a negative of the hand, rapidly came down from

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40 minutes to four, and shortly afterwards a gentleman won the race in a canter by producing a negative with a single spark from his coil. As it is far from my intention to attribute "ulterior motives" to anyone, I can only conclude that this investigator had not properly grasped the meaning which is generally accepted for the word "negative." A negative, I take it, is an image which is capable of producing a print. That he may have obtained an indistinct image I can quite understand, but that under any conditions it could be considered a negative I am unable to admit, as no amount of intensification or after-treatment would render such an image sufficiently dense for printing purposes. It is absolutely certain that any exposure short of that which is necessary to produce a good dense deposit in that portion of the plate which is covered only by the protecting envelope, is incapable of producing a printable negative. The rays emitted from different tubes vary so much in their penetrative power, that some method of measuring them is a necessity to the constant worker. There are at least two methods of testing the actinic power of the rays and of finding out the shortest exposure necessary for producing a negative upon a given make of plate. The first is by using a Rayo-meter—an instrument formed of superimposed layers of thin metal of diminishing size. The second method is carried out as follows:—The protecting cover of the plate is ruled across with lines at a given distance apart. The covered plate is now placed in position under the tube—the length of spark used and the distance between the tube and the plate being carefully noted. A thick piece of sheet lead, having a straight edge, is now laid over the plate so as to protect all but the first marked off division. This is exposed to the action of the X-rays for a definite time (say 10 seconds), when the current is cut off. The edge of the lead is now moved to the second line, and again a similar exposure is given. The process is repeated until the whole of the plate has been exposed, when the last exposed division will have had an exposure of 10 seconds, whilst the twelfth (counting the shortest exposed division as one) will have received 120 seconds' exposure. The plate should now be developed with a standard ferrous-oxalate developer, until the least exposed portion has obtained some density. An examination of the negative will show which portion has received the correct exposure, granting, of course, that the rays from the tube were sufficiently powerful to produce the best result in the length of time occupied by the full exposure. If it is thought that none of the exposures have been sufficiently long, the experiment may be repeated on a second plate (the whole plate being given an exposure equal to the most lengthy one of the first plate before the first division receives its extra 10 seconds). I have found this method exceedingly useful in helping me to form a judgment of the working of my apparatus, and if the standard ferrous-oxalate developer be used, together with a timed development; we have at hand a ready means of determining the relative rapidities of various brands of plates.

For ordinary medical work I have not found the special plates which have recently appeared on the market of any great advantage. At the same time the marked effect which the X-rays produce upon the fluorescent screen, even at a considerable distance from the tube, leads me to think that extended investigation will ultimately enable us to produce a plate which shall be far more sensitive to the rays than any at present at our command.

Unfortunately the most fluorescent substances we know of are also the most opaque, platinocyanide of barium and tungstate of calcium being two of the most opaque salts I have as yet experimented with.

I have already given my reasons for thinking that the fluorescence of the support is not the direct cause of the photographic result, although it is certain that fluorescence can be made to greatly intensify the actinic action of the rays. The results, however, which are produced under these altered conditions are nothing like so sharp or perfect as those produced without the aid of a fluorescent medium.

For surgical purposes a flexible support has distinct advantages over a rigid one, inasmuch as such films can be brought nearer to the parts to be radiographed. Experiments carried out with the view of obtaining a flexible support which, whilst being highly fluorescent is at the same time transparent not only to the X-rays, but to light, might be productive of results which would place increased power in our hands.

Having experimented with many of the fluorescent substances which have from time to time been recommended for increasing the action of the X-rays upon the film, by placing them in contact with the film whilst the plate is exposed with its uncoated surface nearest to the tube, I

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LUSCIOUS FRUIT

BY J. DE BRUYN KOPS

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have failed to produce any very satisfactory result. Some short time since, fluor-spar was highly spoken of for this purpose. On exposing a number of plates under one-half of which was placed a card covered with this substance, I failed to produce a marked effect, and moreover, in each instance the film developed from the glass side, equally on both halves, proving that the fluor-spar could have had but a very slight effect. If the fluorescent card be placed above the plate, what is gained by means of the fluorescence, is lost by virtue of its opaqueness to the rays, and moreover the resulting negative is spoiled by the grain which is produced.

In the matter of developers there is little to be said, with the exception that one that acts slowly and gives a good depth of image is preferable to the new quick-acting ones, which cause the image to flash up directly they are poured over the plate. Pyro-soda (Ilford formula) and the hydroquinone developer of Thomas, have in my hands yielded the best results.

To practical radiographers one of the most important points is that of tubes. That the so-called "focus tube" is a great improvement upon the older forms is certain. There is, however, even now plenty of room for improvement, and further experiment cannot fail to produce better results.

The last competitor in the field, viz., the "Penetrator" tube of Messrs. W. Watson and Son, is a distinct advance in many respects. The chief faults I had to find with former tubes were, firstly, that they were too short, hence sparking over and brushing from the platinum loops was a common occurrence; secondly, their shape rendered them peculiarly liable to be pierced by sparks; and lastly, the thin platinum loops by means of which they were connected with the coil were always breaking off. The "Penetrator" is made of such a length that sparking over is almost impossible, hence the shape is not a matter of such great importance as it was, and moreover the thin loops are replaced with thick aluminium ones, which will stand handling with impunity. This is not all, for in the later patterns the cathode pole is protected by means of an extra wine glass shaped covering of glass, which protects the tube itself from the minute particles of metal which fly off during use, and which cause the bright patches which proved a source of danger in the older forms. The lives of the older forms of focus tubes were exceedingly short, owing to the fact that sooner or later they sparked over. Directly a tube commences to do this I know that it is in danger, as it is certain in a short period to be pierced by a spark, which enters through one or other of the bright patches previously alluded to, which appear to have an attractive influence upon them. I have now been using one of the "Penetrator" tubes continuously for over two months, and so far it has not once sparked over.

I have assumed that these bright patches are due to the flying off of particles from the cathode pole, because in the first tubes I used (which were supplied with copper poles) pieces of glass were actually chipped from the tubes by the force with, which such particles were cast off.

It has previously been suggested that the cathode pole should be evenly finished, and finally polished to overcome this defect. The arrangement, however, which has now been adopted, appears to act so well that nothing further is required in this respect.

Crookes believes that these "bright patches," or "jets" as he prefers to call them, are due to particles of residual air contained in the substance of the tube, and says "there is very little evidence of any scattering of the cathode pole."

(This tube however, contains small loose pieces of glass which have in some way been forcibly detached from its interior surface.)

It appears to me that little effort has been expended upon discovering the exact degree of vacuum which is necessary to produce the best results.

I may here mention that tubes differ to a very great extent, and hence, I think, has arisen that unfortunate classification of the X-rays into X^1, X^2, and X^3,—X^1 being said to go through bone whilst they will not go through flesh, and so on. That classification seems to me to be absurd. That tubes differ in their penetrative power is absolutely certain, and one tube I have tried, produced most curious results, for whilst it gave a most dense deposit in the portion of the plate which was covered by the protecting envelope, it failed altogether to pierce the flesh with a fairly full exposure. The best simile of the difference in the effects of rays has been given by a German, who, instead of dividing them into X^1, X^2, and X^3, prefers to compare them with the various rays given out by a piece of iron, at varying degrees of temperature.

(*To be continued.*)

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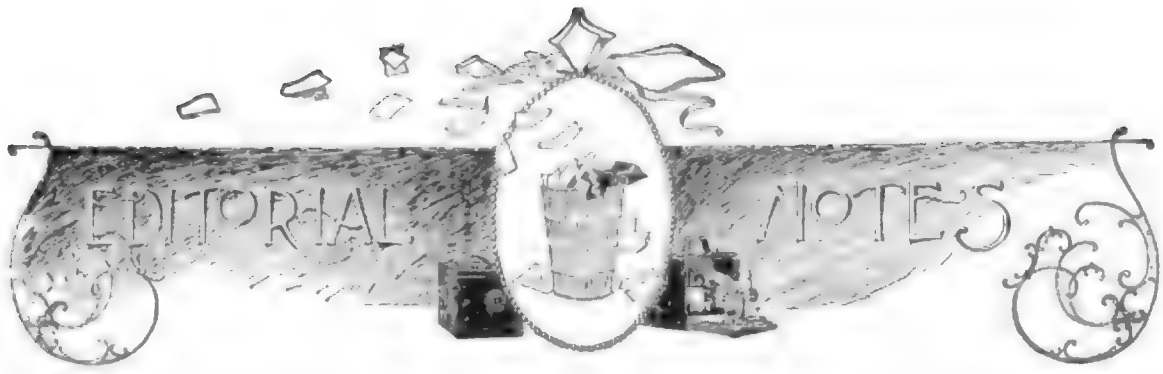


WAITING FOR THE BOATS

BY F. G. SMART.

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We regret that in our editorial notes in the May issue, anent medals awarded to Americans at Calcutta, we omitted to mention the silver medal awarded to Mr. S. Ashton Hand, of Philadelphia, for his picture "In Tow," No. 83. Mr. Hand is one of our most promising workers and we expect to see him reap many honors in the days to come.

* * * * *

The awards in our Night Photography competition are as follows: Silver medal—T. J. Preston for "A Rainy Night in the Tenderloin." Bronze medal to H. Edwards Ficken for his picture "Evening."

* * * * *

Articles and pictures for our 1898 annual are pouring in from all directions, and we are already able to announce an annual far ahead of anything that has yet been attempted. We shall be glad to receive short practical articles, hints, new formulæ, etc.

* * * * *

A writer in the *British Journal of Photography* says: "A veil imparts a patchy appearance to the face. Gloves make the hands appear much larger than they are in reality. It is unwise to wear a new dress; it always falls in awkward folds. Whenever possible, it is money well spent to drive to the photographer's. A feather boa or a lace fichu has a wonderfully softening effect on the features. Generally speaking, the head and shoulders make a far prettier picture than a full length portrait. Above all, if you want your sun picture to have a natural expression, you must forget where you are. Unless there is any urgent reason for it, it is a great mistake to be photographed if you are either out of health or in low spirits. A just-the-mode-of-the-moment style of costume or coiffure will "date" the photograph, and soon make it look out of fashion. A white dress, or one that takes "white," gives a ghastly effect, and one far from becoming, unless the sitter is young and pretty.

Writing on "the everlasting question of choice of lens," Prof. W. K. Burton, in *Photography*, sums up as follows:

1. Such terms as "cabinet lens," "whole-plate lens," etc., may be taken as meaningless, except in so far as they generally indicate that the lens will illuminate (not necessarily give definition to the corners of) a plate of the size mentioned.

2. Size of plate having been decided on, the first factor to be considered in selecting an "all round lens" is the focal length.

3. Experience has shown that for the great majority of work, the most suitable focal length is somewhat greater than the diagonal of the plate, say from one and a quarter to one and a half times the length of the plate.

4. For portraiture the best focal length is twice the length of the *print*, that is to be produced

5. Leaving telephotographic lenses out of the question, any modern photographic objective will illuminate a plate to the corner if of the focal length indicated.

6. Other things being equal, the larger the aperture with which a lens will define sharply, the more generally useful is the lens.

7. Other things being equal, the more uniform the definition throughout the field, with given aperture, the more *generally* useful is the lens.

8. The more equal the illumination throughout the field, the more useful will the lens be for *all* purposes.

9. With the diaphragm in the proper place, the single lens gives more equal illumination than any other.

10. In compound lenses an approach to uniformity of lighting is favored by (*a*) proximity of the combinations of the lens, and (*b*) large diameters of the combinations relative to the maximum diaphragm aperture.

11. The necessity for, or advantage of, rectilinearity need not to be more than mentioned. All modern compound photographic objectives

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may be said to be practically rectilinear. Even single lenses of the focal lengths mentioned give no perceptible distortion except with the most trying subjects.

12. A lens is commonly called "wide-angle" if it will illuminate, and define with large or small stop, a circle of diameter equal to, or greater than, the focal length by 1·5.

13. Apart from the "diffusion of focus" introduced in some lenses, there is no special "portrait quality" in a lens sold as a "portrait lens." The suitability, or the reverse, of a lens for portraiture is decided mainly by maximum defining aperture, and *focal length relative to the size of picture to be produced.*

14. Apart from considerations of "diffusion of focus," it is pure waste of money to purchase a portrait lens unless it is intended to use it with a larger aperture than is available with any of the many modern rectilinear forms of lens. Stopped down to an aperture equivalent to that of such rectilinear lenses, the performance of a portrait lens will be *inferior* to that of the rectilinear.

15. Except for small work, say up to portraits eight inches long, apertures greater than those given by many modern forms of rectilinear lens cannot be made use of on account of lack of depth of focus, and the purchase of large "portrait lenses" is therefore generally money thrown away. Lastly—a repetition—*the focal length is the principal factor to be considered.*

* * * * *

At a meeting of the Croydon (Eng.) Camera Club, Mr. F. P. Wratten stated that he considered this method of intensification to be theoretically, the most perfect, inasmuch as, if properly carried out, the resulting negative image consists of metallic mercury and metallic silver, the whole of the silver of the image being left in the film. However, he says, like most theoretically perfect processes, it needs to be carefully carried out, or stains will inevitably result. This is, in one way, an advantage, inasmuch as, if a negative be intensified by this method, and present no stains when it is finally dried, it may be relied upon to be permanent; whereas, by other methods of mercurial intensification, the operation may, to all appearance, have been successfully carried out, but, on keeping, stains will gradually make their appearance, and, it may be, a valuable negative will be seen to gradually perish before the owner's eyes.

The ferrous-oxalate method of intensification may be carried out in diffused daylight. If sufficient density is not obtained, the process may be repeated to any required extent.

In the first place, all hypo must be carefully removed by thorough washing. If this has not been done, the hypo should be decomposed by the application of a bath of alum, or, better, a dilute solution (1:200) of hydrochloric acid. Then thoroughly wash and immerse in a saturated solution of corrosive sublimate, to each ounce of which a drop of strong hydrochloric acid has been added, till the image is bleached. Then wash for twenty minutes in running water, rinse with distilled water, and soak in the same for five minutes. The treatment with distilled water is necessary, as the lime in the top water would otherwise cause markings. Immerse the bleached and washed negative in a solution of ferrous-oxalate, prepared by adding one part saturated solution of ferrous sulphate to four parts saturated solution of potassium oxalate. The image will now gradually blacken. When this blackening has extended to the back of the film, pour off the solution of ferrous-oxalate, soak in distilled water for six minutes with three changes, and finally wash well. If distilled water has not been employed, it is necessary to soak the plate after washing in a one per cent. solution of hydrochloric acid for a few minutes, to remove the oxalate of lime deposit, then rinse well and set up to dry.

* * * * *

An English amateur, Mr. J. Bulbeck, recommends the method of reducing with bromide of copper. The main idea, he said, was by this method to restore the silver in the film practically to its original condition, and then, as the density goes through the film while the detail lies principally on the surface, to redevelop to a less depth than at first. In fact, Mr. Bulbeck said, it might be called intensification of detail or reduction from the back of the film as preferred. He was not the discoverer of the process, for it was advocated by two or three writers, but in practice he found it so very satisfactory that he drew the members' attention to it. He could not recommend it for negatives showing clouds, however, for as they were generally on the back of the film they were nearly sure to be lost on redevelopment.

In demonstration Mr. Bulbeck, taking sulphate of copper (bluestone) and bromide of potassium, dissolves each in the proportion of one to twelve, or thereabouts, then mixes and

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filters, adding water until a blue solution is obtained. In this, the plate or print is bleached, well washed, taking care to keep the film uppermost, and then redeveloped with preferably the usual metol formula, stopping development while the back is still white. The usual hypo bath and final washing completes the process, when, if the density is not enough reduced, the whole operation may be repeated again and again till the required result is obtained or the operator tired. Lantern slides can be toned by bleaching with bromide of copper and redeveloping with ferrous oxalate.

* * * * *

One of the attractive features of our next annual will be some reproductions of some beautiful seascapes by Mr. F. H. Worsley-Benison, of Brighton, England. This gentleman has made a study of the sea, the result of his labors being a set of the most beautiful seascapes we have seen for some time. They are printed in colors, with an olive green color, and are remarkably effective. We recommend our readers to write for a list of these studies. They are published at a very reasonable price.

* * * * *

The advantages of the alum bath (before fixation) seem to me to be, as a rule, overlooked by photographers writes C C in *The Photographic News*. Whenever it *is* mentioned the advice given usually is: "Do not use alum; if your plates frill, discard that make of plates and use another." All the photographers whom I know personally do not "bother with the alum bath."

Now to those who have negatives worth having, is not the safe avoidance of risk *only* of frill a blessing? And where the bother, that is thought so much more of, comes in, I have not yet seen, after years of use of the alum bath.

There are two distinct advantages worth consideration besides the above:

I.– It makes the film so hard and firm that after the final washing the film may be wiped surface dry with a clean, dry handkerchief, folded into a smooth pad. Considerable pressure may be applied, but, of course, it must not be *rubbed*. It may then be dried in five minutes (if wanted in a hurry) before the fire, and in any case it dries very soon, *and perfectly even*, leaving no marks, as often happens when drops of water are left standing on the film when drying.

Curiously, I notice that if a negative is wiped directly after its removal from the washer, the film contains less water than if it is left wet some time before wiping.

This wiping cannot be done *safely* on a negative which has not been in alum. I omitted to alum one the other day (by mistake), and in wiping the handkerchief took a neat round piece out of the film!

II.—Alumed negatives are less liable to accidental injury.

I never varnish my negatives, never having found the necessity for doing so, as they never seem in any way injured in the printing, etc. Indeed, though I am careful in handling them, I am often surprised at the accidents they will safely go through.

When alum is used before fixation care must be taken that it is a clean solution, and that the negative is thoroughly rinsed before fixation. Otherwise blotches of an opaque white substance are deposited in the film, accompanied by a swelling of the gelatine. The deposit will fix out, but the swellings remain, and as they are when dry more transparent than the rest of the film, the negative is permanently spoilt.

The avoidance of this evil is easy. I have had about three cases in 200 or so plates.

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THE OBJECTS OF WHICH OUR PICTURES ARE COMPOSED.

BY A. HORSLEY HINTON.

In our critical remarks upon the competition prints on the 8th inst., something was said upon the function fulfilled by animals in a landscape picture, or indeed in any other class of subject. It was asserted that those animals which the landscape photographer is fondest of introducing into his pictures are *of themselves* and *for themselves* valueless from a pictorial standpoint, and are desirable only for the assistance they may render towards forming a successful combination in a picture as a whole.

The misapprehension of the part played in every picture by the various natural objects, be these animals or anything else, lies at the root of so many a feeble performance, and is the cause of so much failure on the part of photographers who have not devoted time previously to the consideration of some of the simplest art principles, that the subject may be worth reviving here for the benefit of those who are amongst the less advanced of pictorial workers.

During the past week I came across, in the writings of a well-known photographic worker, the statement that "those works of art are most successful which approach most nearly to nature," a remark which amongst those whose business is art and not photography will be regarded as little short of imbecile.

And yet such statements are made frequently, and there are, I fear, hundreds and thousands who have begun to think about art matters *after they have become photographers* who quite readily accept such teachings, and marvel that art can aim at anything higher than the accurate copying of nature.

Those of my readers who have become acquainted with the principles of painting, or have taken the trouble to read or understand the aims and intentions of art, who are, in short, not wholly absorbed with the mere photographic manipulations and contrivance, will be astonished that I should think it necessary to devote some space here to explaining for the beginner that art is not an imitation of nature, and to telling the student that if he would employ his photography for pictorial ends, and prove it to be an artistic method, he must primarily fully realize that it is not sufficient for him to merely strive to produce an accurate representation of any chosen scene or objects.

When the question of sharp focus *versus* suppression and diffusion was being discussed most hotly, some few years ago, it is singular to note that the argument was chiefly concerning what *the eye saw*, and how the eye perceived things, and whether the representation of objects sharply defined or blurred and without detail, most accurately represented the scene as it appeared to the eye.

Did ever the main issues of an argument go so astray?

The justification of sharp focus, the legitimacy of diffusion is not found in what the eye sees. *The amount of detail, the sharpness of outline, etc., which the eye sees has nothing whatever to do with the subject.*

But my present purpose is not to discuss the question of focus, except as it bears upon the other matters I have in mind.

Aware that there are a very large number of beginners, in various stages of progression, who earnestly desire to make their work more acceptable from the artistic or pictorial standpoint, but who knew but little of art itself, I should be glad if I could open their eyes more fully to the fact that good art does not consist of the accurate representation of the objects in nature, and the nature and character of the particular objects of which our pictures are composed is a matter of secondary importance as compared with *the manner in which they are represented.*

To those who have not previously thought of these matters the foregoing enunciation will seem perhaps perfectly unintelligible, and all the great painters who have ever lived will be thoughtlessly quoted as evidence that good art does consist of truthful representation of chosen models. I say "thoughtlessly," because I am going to refer to the works of acknowledged master-painters in support of my point.

Just now in London are two exhibitions of choice works of the late Lord Leighton and of Mr. G. F. Watts, R.A.

Now look round amongst those pictures, or look at any great work by living or dead modern masters, and just consider if those figures and scenes represent the originals with the same fidelity that a mirror would do. The delicacy of the flesh texture, the exquisite drawing of hands and feet, the beautiful contour of face and features, the masterful arrangement of draperies, the mere blotted in suggestion of a distance – foliage, trees, distant palaces, or what not, as the case may be—is all that absolute fidelity to nature? Our bookstalls and other stations have been displaying a large Christmas number plate entitled "Flaming June." Think of that in the same frame of mind that you examine a photograph, and do you not think you will find many items omitted which must condemn it as an exact transcript of nature? And what of the wondrous allegories which Mr. Watts has placed on canvas? Do they set you thinking of the models chosen by the painter, do you feel that all those figures are portraits, and do you care for, or does your admiration of the picture depend on the possibility of their being exact likenesses either of face, figure, or clothes?

It may be advanced that such art as these great painters' is not a fair comparison. Very well, then, shall we turn to the painting of Mr. Leader, a great favorite with many landscape photographers, who vainly think Mr. Leader's pictures are but a little beyond the achievement of their own cameras? Well, now, look carefully at any one of Mr. Leader's bright glowing Surray or Welsh landscapes, and what do you see?

Take that group of trees against the flaming evening sky; will you please take your pencil point and place it upon any single little leaf in all that mass of green which represents the foliage? Yes, you have found one, a tiny spot of green amongst the darker greens. Look again. Is it more like a pin's-head in shape, or an oak leaf? You say it is probably as near to the shape as his brush could make it. (Dear me, alas for the feebleness of tools! What are the limitations of the photographer compared with this?) But look again; you found one little dot which stood for a leaf, but what next? The broad stroke of a flat brush stands for a hundred green leaves, and another, and another. Was ever the most inveterate "fuzzeyist" so bold in over-riding detail as this?

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Now look at the roadway channelled with deep cart-ruts and gleaming rainpools: look—and you'll look in vain—for the tiny pebbles, the turned-up stones, the scraps of paper, stray winkle shells, a broken pipe bowl, a rag, a cast shoe, things which more or less litter every road so near a group of cottages or a village church, as this road is shown to be. Under the shadow of the thorn bush, and again close to the foreground, the painter has given us tufts of tall grass, has delicately drawn the leaves of wild plants and some flowers; but what of all the other millions of grass blades and thousands of wild plants for which a mere broad touch of color, a daub, does duty?

Do you suppose such omission was because the painter *couldn't* or was it because he *did not purpose* to put all this detail in?

Think of the pictures of streets and old buildings in dingy towns and cities, the wharves and over-hung waterside buildings of some northern cities, of London, and elsewhere. How picturesque has the picture seemed, and the objects themselves we know to have been loathsome, pestiferous, and the dirt and squalor of their presence would have driven us away. See the sweet groups of rustic children which Mr. Birket Foster so loved to give us, gathering berries, playing on the shore or amongst the wild flowers. The children in those pictures were fit to enter a queen's drawing-room; their raggedness and untidiness in the picture possesses a charm; stains on clothes, on faces, begrimed hands, all-prevading stamp and suggestion of sordidness, the fustiness of clothes soaked wet with the dew from bushes and grass, all these are details which the artist has *not* focussed sharply. Take the productions of any painter notorious for the delineation of detail, any of the earlier Pre-Raphaelites, or the great Meissonier, and you shall find that their reproductions of detail does not contain one-hundredth part of the detail that the average photograph possesses on every inch of its surface.

Let me say, and then please think it over and see if you can refute it, that no painter or draughtsman ever yet lived who produced in the whole of any given picture one-thousandth part of the detail which the commonest lens puts into every square inch of a sharply focussed photograph—no painter, no skilled workman of any kind, yet lived who *could* do so even if he desired.

But as I have already said, I am not mainly concerning myself just now about detail, but have harped upon it now for a little space to convince some, as I fear there are still many who need conviction, that the artist's strong point is *not* fidelity to nature. That he might come much closer to nature than he does, must also be evident, so that we may conclude that imitation of nature is not even his intention.

Criticism as to truth to nature—"Not *true*," "So *like*"—and a discussion as to whether such and such things in a given picture could ever have been, are but various disguises in which this bogie of misconception haunts our photographic assemblies.

Can we not cultivate the habit of looking at a picture and forgetting nature from which it is derived? Can we not get accustomed to judging a picture, good or bad, according to whether it seems to successfully *express the idea which its author wanted to express*, and not bother as to whether it represents some place or scene, or whether it faithfully portrays the particular objects contained as they would appear in nature.

But, says my doubting reader, were we to abandon the endeavor to produce a likeness to nature, should we not fall into all kinds of folly? Is it not because photography has cultivated people's preceptions as to nature's truths that photography has been useful as a handmaiden to art generally. Is not this endeavor to be truthful an anchor, to cast off which would mean to drift into all kinds of errors and excesses?

Yes, it is an anchor and a good one, and to continue the simile, I say give it more cable, so that we may swing more broadly, but being anchored still, cannot get far away.

The precise amount of accuracy which is necessary or the amount of license which may be given is not easy to define. We must start by recognizing the fact that if our picture is (as it should always be) an endeavor to express pictorially some idea, sentiment, or impression, we have to do this by employing certain more or less familiar objects which are objects in Nature. Some objects will serve our purpese better than others. Some objects being curious, unusual, or mis-shapen, are especially unsuitable, because they would distract attention from the idea we are endeavoring to express. If we represented familiar objects so faultily that they seemed unusual or grotesque, then they would have the same injurious influence as objects of themselves unusual or ill-chosen.

Sufficient truthfulness to prevent the spectators feeling the existence of an untruth is essential. Sufficient truth to account for the effects produced comes to the same thing, and is equally essential. But that amount of truthfulness which will stand the analytical examination of the expert in physical science is not essential, nor even desirable, because such excessive accuracy is only produced at the risk of its overwhelming every other consideration. Of course, I know that in preaching this doctrine there is a danger of causing some to commit fatal errors and tempting them to take refuge under the excuse, "It's true enough for the purpose."

I do not think that, with the space at my disposal, I can take the matter much further than that, but shall be content if I have just unsettled the belief that accuracy to what the eye sees is the chief aim of art, or that artists seek first to truthfully copy Nature; and I should be glad if I have by but ever so little weakened the position of the critic who condemns a picture solely because upon close observation he discovers some particular which is not, according to his knowledge, just as Nature had it.

It *might* be advanced that it were impossible to condemn any representation as untruthful to Nature, because Nature plays such pranks and knows some such rare freaks that a man with two heads water flowing *up* an inclined plane, and a thousand monstrosities are all within the range of actual fact. Never a day passes but we may observe appearances and conditions in Nature which astonish us by their unusualness, confirming the saying that truth is stranger than fiction and nothing more un-Naturelike than Nature. But such argument is needless.

Now if irreproachable accuracy to the whole catalogue of nature's truth be not necessary, it might almost

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follow that the mere objects included in our picture are of little importance so long as they constitute a design or arrangement which adequately expresses the feeling intended. This is so, though whether this position can be said to naturally follow from the previous argument matters not.

I want to get my readers out of the habit of photographing a flock of sheep or a herd of cattle because they are a flock of sheep and a herd of cattle. There are many who have got beyond the stage of photographing a ruined castle because "it is such an interesting old place," and would call the ordinary representation of so-and-so church or bridge merely topographical and therefore contemptible; but these same will pull up and set the camera going instantly if they encounter a group of sheep or some cattle drinking, or what not. The ease with which photography enables us to portray living and moving objects may have originally had something to do with this mania, but it probably arises mainly from a misconception of the function played by the objects composing the picture.

It is customary to regard certain objects as intrinsically beautiful, and those that so consider them would say that pictures are only composed of such beautiful objects.

How is it then that we have very beautiful pictures produced out of objects, themselves admittedly hideous? Think for a moment and you will recall pictures in which the ugly masses of riverside factories, the graceless forms of river tugs and barges, and the filthy water of the city river combine to make the most pleasing effects. In the hands of the artist the stumpy figure of the cargo barge or coal boat will assume more lovely guise than the graceful lines of the clipper-built ship or racing yacht; the rugged cart horse more beautiful than the elegant and well-groomed racer, a mere barn or dilapidated cabin more pleasing than the Italian villa or turreted palace.

This goes toward showing that the nature of the object itself is of little consequence (because it is not represented with absolute fidelity to truth in its entirety), and hence I would suggest that as most beautiful results are obtained with unbelief materials, no more beautiful (though different) results are obtained with sheep and cattle. There really is not anything beautiful or pleasant in one of a herd of cattle fresh from wallowing by the oozy river's brink, nor a soft-eyed sheep with its masses of shaggy wool harboring and covering what is best not thought of. Place the rotund figure of your unshorn sheep, or the lanky form of your newly shorn one on a pedestal of marble, and set it aloft. It is not beautiful to look at, is it? The strange uncouth angularity of a cow is not to be compared with the gracefulness of many another "unpicturesque" animal, and so it remains for us to conclude that their beauty only exists as a part of an entire picture in the manner in which they may be found forming masses of light and shade in a landscape where otherwise no light and shade might exist.

And now we are brought round to the first contention, that if these and such objects are only useful in pictures as masses of light and shade or as contrasting and harmonizing forms, then there is no need to portray them with such extreme exactness and precision as to give us a superabundance of details which do not contribute to beauty.

If we are photographing with a pictorial aim, that is, seeking to express an idea, then the less truth without apparent violation of truth the better.

If every object, or even some objects, are portrayed with every detail clearly defined, the attention of the spectator is inevitably taken up with the collection of facts or truths which is here thrust upon his notice. And that is not the idea which the picture maker is trying to express, so that in such case sharp focus defeats the end in view.

As I said some weeks ago when discussing the subject at some length, sharp focus is not wrong in itself, but it may not be the best means of carrying out one's intention, and if that intention be pictorial effect then it usually is not the best means.

It is not a question of what the eyes sees; it may not even be a question of what is the impression which remains after looking at a scene, but it is a question of rendering objects in such a way as they will best express or make others feel the idea or feeling which we had when conceiving the picture.

Has it ever occured to you that inasmuch as our older teachers have taught us to focus sharply the principal feature in the picture then in accordance with that teaching we should, so to speak, focus sharply the evening light, the growing shadow, and the gradual haze, instead of the trees and fields, the river and grasses, if our picture be of an evening scene? Or if our theme be sunny June, it is the sunshine, the light, the clear air that should be accentuated or focused, rather than the terrestrial objects which we utilize merely as vehicles to convey to others our thoughts.

And now finally it should be noted that I have been speaking of that class of pictures only which come most usually to the photographer's hand. Perhaps we may be allowed the terms Idyllic and Epic for the two classes into which most photographic pictures naturally fall, and it is to the former class that my remarks are intended to chiefly if not exclusively apply. In pictures, whether by photography or other means, of the descriptive, illustrative, or, as I have called them, epic class the consideration of the actual objects and models doubtless does enter in, and upon their fitness, and the manner of their production depends a great deal of the sentiment and feeling which is the *raison d'etre* of the picture, but if the majority of my readers will but apply what I have said to their own average photographic picture work I am not without hope that some stray suggestion for good may be found.—*The Amateur Photographer*.

ON BOTTLES.

BY G. E. BROWN, F.C.S.

It is surprising how many bottles, of all sorts and sizes, accumulate in a dark room where a fair amount of work is done, particularly if the latter is of a varied character. It conduces greatly to neatness of working, and therefore to excellence of results, if all dirty bottles be well cleaned and put away in a place by themselves as fast as they are finished with. A good many mistakes are made by pouring solutions from wrong bottles or by making a solution in a dirty bottle. The following hints,

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then, about bottles, homely though the subject may appear, are worth remembering:

Cleaning Bottles.—For removing grease, use soft soap dissolved in hot water, well cleaning the sides of the bottle by means of a mop made by binding a piece of rag on the end of a stout wire. Bottles that have contained silver solution are instantly cleaned by using nitric acid (aqua-fortis). Use the commercial acid, and take care to avoid as much as possible getting the acid on the fingers, since it produces disagreeable yellow stains which nothing will remove. The most generally useful liquid for cleaning bottles is hydrochloric acid (spirit of salt). This is so cheap and effective that every photographer ought to keep a bottle by him for cleaning, not only bottles, but measures, dishes, etc. Do not throw away what has been used for cleaning, but return it to the stock bottle, and use until solution loses its detergent properties. Another good cleaning liquid (particularly where the destruction of all organic matter is desired, as in the case of bottles to hold silver or gold solutions) is potassium bichromate (half an ounce) dissolved in strong sulphuric acid (10 ounces). After using this, be sure to pour all of it out of bottle before rinsing out with water, or the heat developed by the mixing of the sulphuric acid and water may crack the bottle.

Grinding Stoppers into Bottles.—If the stopper of a bottle gets lost, do not discard the bottle, but get an old stopper—slightly too large—and grind it down, using first a fine file on the stopper, and then grinding the stopper in the neck of the bottle with flour of emery, moistened with water. Without much trouble a good fit can be secured.

To Remove Stoppers that have stuck, various dodges have been published. For bottles with flat stoppers (English make), Farraday's plan of inserting the stopper in a slit cut in some fairly solid woodwork, and by turning the bottle to twist the stopper out, is very good. Tapping all round with a block of wood often loosens a stopper, but avoid using any metallic articles for tapping, as these are very liable to break the stopper off. Another effective wrinkle is to wrap a piece of string once or twice round the neck of the bottle, one end of the string being attached to a hook in the wall. By grasping the loose end of the string in one hand, and with the other moving the bottle two and fro, the neck of the bottle is sufficiently expanded by the heat of friction to allow the stopper to be removed. A similar end is reached by holding the neck of the bottle over a small gas flame, taking care to keep the bottle continually turning.

Stopper for Alkali Solutions.—Caustic alkali attacks corks, while it causes glass stoppers to stick in their necks very tightly. It is generally recommended to grease the stopper with vaseline, but the best plan is to use an india rubber (or caoutchouc) bung, which will not stick.

Labelling Bottles.—The permanent labelling of bottles is an important point. Nothing gives rise to so much confusion in a dark room as bottles whose labels have dropped off. A very safe label is one written on the glass itself with hydrofluoric acid, though this is hardly possible if there is much writing to be done. The hydrofluoric acid mixture is most easily made as follows: Mix in a leaden dish barium sulphate (3 ounces) and ammonium fluoride (1 ounce); then add enough sulphuric acid to make the mixture semi-fluid; keep in a gutta-percha or lead bottle, and apply to the glass with a fine camel's hair pencil or quill pen. A similar mixture can be bought ready made under the name of "Sabatier's ink."

To ensure paper labels sticking well proceed as below. Bottles labelled in the way to be described have been in use by me for years without showing signs of separating from the glass, even though they have been used in the trying atmosphere of a chemical laboratory. Make the outside of the bottle quite clean, moisten the gummed side of the label evenly with a wet pad of cloth, smooth with a duster, and then roll on a soft surface, such as five or six folds of blotting paper. Allow to dry, and then give a coating of size (made by dissolving 1 ounce of glue in 10 ounces of water), taking care to completely cover each label. When the size has dried varnish with "oak" or "church" varnish, using a camel's hair brush of same width as label. Use as little varnish as possible, and set bottles aside till next day, when they will be ready for use.

Removing Labels.—If you wish to remove a label, don't scrape it off with a knife. Instead, well moisten the surface of the label with the tongue or otherwise, and then hold it over a lamp or before a fire. The heat causes the water to penetrate to, and soften, the adhesive. Catch hold of one corner and pull; it will come off nearly entire. This dodge is no good for labels affixed as described above. In their case, there is nothing for it but scraping with a knife, though, if the bottle be first allowed to soak in warm soda solution, the process will be greatly assisted.

Ruby Bottles.—One often wishes to keep solutions away from actinic light. To do this, coat an ordinary bottle with ruby varnish made by dissolving 120 grains of finely powdered aurine in a pint of ordinary negative varnish.

To Cut off the Bottom of a Bottle.—In making a dark-room lamp from a hock bottle—and a very cheap and efficient lamp can be thus made—the cutting off of the bottom of the bottle is a somewhat difficult preliminary. Among the many methods recommended the following may be cited as reliable: Produce a piece of stout whip-cord, and wind it once or twice round the bottle at the place where the separation is desired. Then, holding the bottle firmly, work the whip-cord energetically to and fro (the assistance of a friend at one end of the cord is useful). As soon as a hot ring has been produced on the glass, dip the bottle quickly into a basin of cold water (the colder the better), when a neat crack will be produced right round the bottle; the two portions can then be easily severed.

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NOTES.

Harvard College will shortly be supplied with a new 8-inch photographic telescope.

The Rumford Paper Mills, Maine, are erecting a machine for the manufacture of paper 150 inches wide.

The Camera is the title of a new magazine published as the official organ of the Columbia Photographic Society of Philadelphia.

A San Francisco Photographer has invented a process for photographing in natural colors—at least, so he says.

The Professional Photographers' Club is a new organization, composed of Philadelphian photographers. Their quarters are at 113 North 12th Street.

The *Mail and Express* is now publishing a photographic and magazine supplement with each Saturday edition. It is illustrated with the work of amateurs. The selection, however, appears to be badly made; very few possess any artistic merit.

The Glasgow International Photographic Exhibition, organized by the local amateur photographic association, will be held in the Royal Glasgow Institute of Fine Arts during the months of September and October next, the opening day being Wednesday, September 1st, and the closing day, October 13th.

"Rural Summer Homes," is the title of a neat little book published by the Erie Railroad Company. It is illustrated with a number of photographs showing the beautiful scenery along the lines of the road, well worthy the attention of every photographer on the look-out for beautiful spots.

Leitfaden fur die Ausubung der gebrauchlichen Kohledruckverfahren von G Mercator. Halle a S, Germany, Wilhelm Knapp.

This work forms part 24 of the Encyklopädie du Photographie, and is a complete treatise on the old and new methods of carbon printing.

"Rayfiltergraphs," is an instructive and interestingly illustrated booklet issued by the Bausch & Lomb Optical Co., Rochester, N. Y., and which explains the advantage of rayfilterography, giving numerous examples of work done with the ray filter. Sent without charge by addressing "Department H," of the above company.

Chas. L. Mitchell, M.D., of 1016 Cherry Street, Philadelphia, sends us a sample of his eikonogen powders which we have tried and found excellent in every respect The solution formed by dissolving contents of the two packages gives a beautiful, brilliant negative clear in the whites and with rich density where necessary.

A Man in Philadelphia has been swallowing tacks, copper rivets, a thumb-screw, and other odds and ends, and being radiographed these articles were found occupying a crescent-shaped sac near the "ilium," which shows how near a man may be a fool and not know it. It may be a foul joke, but this man evidently thinks he has a gizzard.—*Photography.*

The proprietor of the cinematograph and his two assistants whose carelessness is alleged to have caused the terrible fire at the Charity Bazar in Paris are to be prosecuted for manslaughter. The Juge d'Instruction has not yet come to a decision as to the responsibility of the Organizing Committee, of which Baron Mackau is the President —*Dalziel.*

The Photographers of Ohio propose making their '97 Convention a banner one, and cordially invite photographers from outside the State to send in their exhibit and meet with them. Any of the officers of the Association will gladly furnish any other information desired. Full particulars can be obtained from L. A. Dozer, Secretary, P. A. of O., Bucyrus, Ohio.

The Reward of Science.—M. Ducos du Hauron, who has done so much for the advancement of three-color work, and was one of the first, if not the first, to turn out three color prints by any method, is in somewhat straitened circumstances, and the *Photo-Revue* has opened a subscription list for him. To be a successful inventor is not the only thing, says *The British Journal of Photography;* one evidently wants to be a successful man of business as well, and be exploited by some of the leading authorities in order to make one's invention successful from the monetary point of view.

The Camera Club (New York) have issued the first number of their new quarterly magazine, *Camera Notes.* It contains two photogravures and some interesting reading matter in addition to the club news. Mr. Stieglitz, to whom most of the credit is due is deserving of the greatest praise for his work. One of the photogravures is by Harley Herton, a perfect gem, and the other, a reproduction of a portrait study by Mr. Steiglitz, by no means inferior. The magazine is carefully edited and should find a ready sale to anyone other than members of the Camera Club.

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The Boston Camera Club, representing a gentleman of high standing in matters pertaining to Aerial Navigation, is authorized to make the following offer of prizes for *instantaneous photographs of large soaring birds:*

A prize of One Hundred Dollars ($100) is offered by the Boston Camera Club for the best instantaneous photograph of a large bird in the act of soaring.

An additional prize of Fifty Dollars ($50) is offered for the greatest number of instantaneous photographs, offered by one photographer, of large birds in the act of soaring.

All contributions should be sent to the Boston Camera Club, 50 Bromfield Street, Boston, Mass., U. S. A., and marked "Cabot Competition."

For full information apply to Mr. Samuel Cabot, care of Boston Camera Club, at above address.

The Photographers' Association, of Ohio will hold their 7th Annual Convention and Exhibition of Photographic Work, at the City Hall, Columbus, Ohio, U. S. A., August 31st and September 1st, 1897.

The following from the '97 prize list is of interest to amateurs:

SPECIAL CLASS: Amateur photographers. Open to the world.

1. PICTURE.—No restriction as to size or classification.
 1ST PRIZE.—Gold Medal.
 2D PRIZE.—Silver Medal.
 3D PRIZE.—Bronze Medal.

All exhibits are eligible to the Salon (a permanent collection containing the gems of their annual exhibitions, owned and controlled by the association) a certificate of honorable mention being awarded to all having pictures selected for the same. Full particulars from L. A. Dozer, Secretary, P. A. of O., Bucyrus, Ohio.

The True Cause of the Paris Disaster.—There have been many conflicting reports as to the origin of the terrible fire at the Charity Bazaar at Paris. The real cause has, however, now been ascertained beyond question by the confessions of the man who occasioned it. The light of the cinematograph, it appears, was the limelight with an ether saturator. This became exhausted and had to be recharged, and, while pouring in the ether, the place being dark, the operator asked for a light. The assistant then struck a match, and the vapor of the ether, as might have been expected, took fire, and set fire to the celluloid films, which flared up, and in a few seconds all the draperies were in a blaze. Both the operator and his assistant are to be prosecuted on a charge of homicide through imprudence.—*British Journal of Photography.*

Formalin as a Disinfectant.—We read, in the *Photographische Mittheilungen*, that Dr. Haefke has drawn attention to the use of formalin as a disinfectant. It is as powerful as bichloride of mercury for this purpose, and less dangerous. The workmen at Schering's factory, who are occupied in the preparation of Formaldehyde, enjoy good health. Formaldehyde is even superior to bichloride of mercury, as it does not fail with solutions containing albumen. It is also useful for the preservation of articles that suffer by exposure to damp, such as leather, books, etc. A suit of men's clothes may be thoroughly disinfected with 30 grammes of formalin. Formeldehyde may be used as a fluid or as vapor, and it is very penetrating.—*British Journal of Photography.*

Neutral Solution of Gold Chloride.—A neutral solution of chloride of gold is prepared by shaking a solution of ordinary gold chloride with some carefully washed "precipitated chalk," which can be obtained from any chemist. A small quantity of the chalk is placed in a filter paper in a funnel, and the funnel is filled up with hot water—preferably distilled water—which is allowed to drain away, and the funnel is again filled up—this process being repeated three or four times. Some of the chalk is then put into the gold solution, which is well shaken from time to time, and then allowed to settle, the clean liquid being decanted or filtered off for use. A simpler but somewhat more expensive plan is to purchase the double potassium gold chloride in crystals from one of the dealers in fine chemicals.

The Year Book of Photography, 1897, edited by E. J. Wall, F. R. P. S. For sale by The Scovill & Adams Co., of New York. Price, 50 cents.

Under the able editorship of Mr. E. J. Wall, this ever welcome Year Book has been considerably improved. The able article on "Elementary Optics," by the editor, is alone worth considerably more than the price asked for the book. There are very many interesting and ably written articles. One section of the book is entitled, "The Photographers' Gazetteer," and gives complete information to intending tourists as to where to go, where to stay, and what to photograph. To Amerians contemplating a visit to England this publication would be invaluable. A review of the latest novelties placed upon the English market completes a very useful and interesting volume.

Improving Negatives.—Precht suggests the following methods of improving negatives with normal high lights and foggy shadows: Soak the plate in water and immerse in a mixture of one part ten per cent. solution of red prussiate of potash and five parts of hypo solution. This clears up the shadows much more than the high lights, and, after washing and drying, the negative should be intensified with bromide of copper and silver nitrate. If the high lights are too weak, and the shadows fogged, the negative should be first intensified with the copper and silver nitrate, and then reduced in the normal reducer. The color of the negative is changed from blue-black to a yellowish-brown. The advantage of these methods is that both may be repeated, and the contrasts considerably increased.—*British Journal of Photography.*

Blue Toning.—Herr Hrdliczka, the well-known collodio-chloride paper manufacturer, says that very pleasing pure azure tints may be imparted to print-out proofs by first printing darker than the picture should ultimately be, then washing in 6 or 8 changes of water for ten minutes, next fixing in a weak (one to fifteen) hypo bath, and finally, after washing thoroughly in eight or ten waters, toning in a bath made up of water, 34 ounces; nitrate of lead, 2½ ounces; ammonium sulphocyanide, 1½ ounces; to which, after dissolution of the

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solids and filtration of the solution, is added one and a half ounces of a one per cent. solution of chloride of gold and of potassium. In this toning bath the proofs lie till they attain the desired azure color, when they are taken out and washed for ten or fifteen minutes and dried. If the toning bath be strengthened from time to time with gold it will last for a long time, but it is well to remember that an old bath works slowly, and does not give the pure azure obtainable from fresh solutions. —*Photography*.

The Pall Mall Exhibition.—The forty-second annual exhibition of the Royal Photographic Society, better known perhaps as the Pall Mall Exhibition, will be held from the 27th of September to the 13th of November, 1897, as heretofore, in the gallery of the Royal Society of Painters in Water Colors, 5a, Pall Mall East, London, S.W.

Medals will be placed at the disposal of the judges. Exhibitors may state whether they wish their exhibits to go before the judges in the Art or the Technical Section, or both. The exhibition will be conducted according to the rules adopted at the Conference of Judges. The undermentioned gentlemen have been elected by the members of the Society to act as judges, and have consented to serve:

Art Section.—F. P. Cembrano, Jr.; B. W. Leader, A.R.A.; Sir J. D. Linton, P.R.I.; G. A. Story, A.R.A.; W. L. Willie, A.R.A.

Technical Section.—Captain W. de W. Abney, C.B.; Chapman Jones, F.I.C.; Andrew Pringle, F.R.M.S.

Entry forms can be obtained on application to the editor of this magazine.

The R.P.S. International Photographic Exhibition, 1898.—The following is the committee appointed to carry out the exhibition. Of this committee of twenty members, one half were appointed by the members of the trade themselves, and the other half by the council of the society. The trade members are indicated by an asterisk. Capt. W. de W. Abney, C.B., etc.; *Conrad Beck (R. & J. Beck); *Frank Bishop (Marion & Co.); F. A. Bridge; *H. H. Hay Cameron (The Cameron Studio); The Earl of Crawford, K.T.; T. R. Dallmeyer; *J. J. Elliott (Elliott & Fry, Elliot & Son); *W. Gamble (Penrose & Co.); A. Haddon; *F. W. Hindley (Jonathan Fallowfield); Chapman Jones; J. C. S. Mummery; G. Seamell; *John Stuart (Ross & Co.); *Paul L. Waterlow (Waterlow & Sons); *J. B. B. Wellington (Wellington & Ward); H. Wilmer; *W. J. Wilson (Paget Prize Plate Co.); Sir H. Trueman Wood, M.A.

Photography in Colors.—M. de Saint Florent, according to *The British Journal of Photography*, who has for so many years been experimenting on this subject, suggests the following method of obtaining direct prints in colors. Celloidine paper is coated with a gum arabic solution, made by mixing nine parts of a saturated solution of gum arabic with one part of glycerine, and adding sufficient alcohol of 90 deg. to form a sort of emulsion. When the coated paper is dry, expose under any colored transparency to sunlight for an hour or an hour and a half, when a negative will be obtained which will show some colors. It is only necessary to expose this negative to light for a few seconds to obtain a positive with all the colors. To fix this image, a saturated solution of calcium chloride, to which have been added a few drops of hypo solution, should be applied to the back of the print. It is impossible to obtain images in the camera by this method, on account of the low sensitiveness of the silver chloride.

Stripping Plates.—Karasek suggests the following method for stripping gelatine negatives: Bathe the plate for ten minutes in a ten per cent. solution of formalin, dry, and heat gently, and coat with a solution of gelatine made of—

Water	1250 parts
Gelatine	300 parts
Glycerine	35 parts

When dry, the negative should be bathed in a five per cent. solution of glycerine, and the damp film cut round with a sharp knife, and the film transferred to a sheet of glass which has been well cleaned with talc, and the edges bound down on to the glass with gummed paper, and, when dry, it may be coated with enamel collodion or negative varnish, and then stripped. Very old negatives cannot be stripped by this method, but require soaking in dilute hydrofluoric acid.—*British Journal of Photography*.

Mending Kinetograms.—A note on the joining of films may be useful, as it is generally convenient to have the films in one continuous length for development, and also to mend tears. The solvent generally used is acetone. Amyl acetate is also used, but cannot be compared to acetone for effectiveness. To join two pieces of film the edges must be well scraped free from gelatine and grease for about a quarter of an inch. The edges are then placed over one another in the proper position and acetone placed between by means of a camel-hair brush, and the two edges firmly pressed together between glass until set. Care must be taken not to use too much acetone or the joint will be weakened by the solvent action of the acetone. Splits at the edges of films are mended by cementing a thin strip of scraped celluloid over the tear and firmly pressing. If any of the holes become torn out others can be placed in the proper position and cemented, the new holes being cut from another similar film, and care being taken that they are kept in proper register.—Edmund A. Robins in *The Photogram*.

To Remove Pyro Stains from the Fingers.—In spite of every precaution, amateurs sometimes find their finger tips in a "frightful" condition from pyro stains.

Instead of wearing the skin away by rubbing it on pumice stone (a method which I find several amateurs adopt), the stains may be got rid of in the following manner:—

Take 7 ozs. of very hot water, dissolve in it 1 oz. of hyposulphite of soda, and ½ oz. of powdered alum; immerse the discolored members in this for about five minutes and the stains will disappear.

Bromide prints which are a trifle dark may be lightened and toned to a beautiful sepia at the same time in the same bath, allowing them to remain in for half an hour.

R. A. H. in *The Photographic News*.

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Suppression of Flickering and Scintillations in the Cinematograph.—*La Nature* describes a method of preventing the well-known light-shooting and flickering that this instrument is liable to. M. Gaumont states that the flickering can be nearly avoided by first-class construction in the apparatus, but that the scintillation is scarcely possible to be remedied by such means. He finds, however, that, with very little loss of light, it is overcome by observing the picture on the sheet through an open network or perforated screen. To carry this idea out effectively, he has devised the plan of supplying each spectator with a neat little fan, through which he may observe the picture while gently waving the fan to and fro or from side to side. Another method is to interpose between audience and stage a light, perforated screen, kept gently oscillating during the time the pictures are displayed. M. Mareschal, who describes this invention, says: "The form of a fan is happily chosen; the price is so small that they may be distributed gratis to the audience, the cost being recouped by the charge for advertisements printed upon them. They will be for the future the indispensable accompaniment of every exhibition of animated photographs."—*The British Journal of Photography.*

SOL AND TAURUS—

NOT FORGETTING THE BOY.

The boy stood by his R.R. lens
 A-waiting for the light,
He'd set his mind to photograph
 That farmhouse on the right.
The slide was drawn, the shutter set,
 It only needed sun
To paint the picture on the plate,
 And then his task was done.

The farmer's bull grazed in the field
 Close to that eager boy,
He eyed the tripod with disgust,
 And reasoned thus with joy—
"If I've four legs to that thing's three,
 And two strong horns as well,
It stands to reason that I can
 Remove it hence pell-mell."

He bowed his head—just then the sun
 Burst from behind a cloud—
"I'm glad I waited till it came,"
 Said he, that boy, aloud.
But with the sun the bull came too;
 Both struck the plate at once,
And which was horns, or legs, or boy,
 To tell might shame a dunce.

There came a sound, a horrid sound,
 An agonizing yell,
That made the welkin ring around,
 And echoed through the dell.
It was the boy, the ruined boy—
 But where, O where was he?
Ask of the bull—or search among
 The branches of the tree!

H. C. S. in *Photography.*

Process and product.—Machinery in motion will probably prove the most popular phase of the 1897 American Institute Fair to be held September 20th to November 4th, at Madison Square Garden.

Aside from the interest inspired by a higher intelligence and a serious purpose, it is human to like to see the wheels go round. The American Institute's Fair Managers are striving to make the 1897 Fair the most important and best in the Institute's long and honorable record. The American Institute is verging on its seventieth year, but judging from the hustling the Board of Managers and the Fair's General Superintendent, Mr. Alfred Chasseaud, are doing, the Institute is like Dr. Oliver Wendell Holmes where he said he was "seventy years young."

General Superintendent Chasseaud has an office in the tower of the Madison Square Garden where he is busy with the details of organizing a big show and arranging the location and extent of space with intending exhibitors.

Of all departments of the 1897 Fair, the Management earnestly desires that of engines and machinery to be the strongest. It embraces the vast variety of inventions which include as main features stationary engines moved by steam, gas, water or wind and all their accompanying contrivances, pumping machinery and all pertaining to it, including steam fire engines, iron and wood-working machinery and tools, textile and paper machinery and that used for the manufacture of leather, rubber, and for grinding and crushing minerals, grain, and spices. Gearing and all elements of moving machinery are included in this department.

The 1897 Fair of the American Institute will be of unusual value to exhibitors providing, as it will, forty exhibition days, and features of unusual interest will insure a large attendance. The flower show adjunct alone will be in several respects the most beautiful, complete, and costly ever held in the United States.

Reversed Negatives.—Professor Lainer, in the same periodical, gives the following particulars of a method for stripping gelatine plates. Having made some experiments with an addition of formalin to the above-mentioned hydroquinone developer, and noticed that the films were easily lifted, the use of formalin and caustic soda for stripping seemed probably useful. The following solutions were prepared:

A.	Water	200 c.c.
	Solution of caustic soda (1 : 3)	10 to 15 c.c.
	Formalin	4 c.c.
B.	Water	200 c.c.
	Hydrochloric acid	10 to 15 c.c.

Some old, unvarnished negatives were soaked in A for about five minutes, and after rinsing, transferred to B. After soaking five or ten minutes, the film is loosened at either of the narrow sides of the plate with the fingers, carefully avoiding the least tear. If this should happen, begin again at the opposite end of the plate. When the film is loosened and turned over for the breadth of a centimeter, it may be stripped without further trouble. The film is turned over in the bath and adjusted to the plate, held by the upper corners and withdrawn from the bath. The plate is then stood up to dry, and after a short time blotted with filter paper to remove any drops of water that might cause blisters. Further practice will show if it is necessary to use plates coated with

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address of sender, must also be mailed in a sealed envelope. Express charges or postage must be fully prepaid. Photographs on which charges are due will be refused. All photographs submitted in this contest are to become outright the property of the Pope Manufacturing Company, to be used by them as they may desire, whether they be prize winners or not.

The competition will close October 1, 1897, and photographs received after that date will not be entered.

The awarding of prizes will take place as soon as possible after October 1st, and in judging the photographs we shall associate with ourselves a number of leading artists, designers and advertising experts not competing, and not likely to be prejudiced in their choice.

Address, Art Department Pope Manufacturing Company, Hartford, Conn.

The Light of Other Days.—It was said by a London contemporary, though the story reads like a translation from another shore (where English is spoken, by the way), that a new society fad is the gathering of portraits of people when they were young. Invitations are sent out, and on the invitations to such a party is written the request that the guest will forward to the hostess, at the earliest possible moment, a picture of herself or himself, taken in early infancy—just how early is not stated. In they come in dribs and drabs, daguerreotypes, tintypes, silhouettes, carte de visites, and a few cabinet photographs—each, in a way, an example of the art in various stages. On the evening of the show they are all arranged on a huge screen manufactured for the occasion, and numbers are attached to them. The guests receive numbered tablets, and are required to write beside each number their guess as to the identity of the corresponding picture. The errors that inevitably result create a delightful degree of ill-feeling among those dear people who are always thinking up some new form of enjoyment. Sly remarks are made about the woman whose baby form has been secured by a daguerreotype, for daguereotyped babies cannot be very young at this writing. Miss Susan Slender is very much offended because some one doubts that the plump baby was the beginning of her present self. Mrs. Plane waxes sore when some one with kind intent exclaims, 'Oh, you were pretty *then!*' And so on, and so on. The atmosphere of the baby party is likely to get either frigid or torrid by the time it breaks up." Now all this is funny of a sort, but the continued use of the words daguerreotypes and tintypes inclines us to the view that the story is the invention of an enterprising pressman, who does not mind calling things by the first word that comes handy, and is something like suitable. Of course, babies might have been taken by the daguerreotype process, but we do not think they are many, and between that and tintypes there is a wide gulf fixed.—*Photography.*

Quick Developers.—Professor Lainer gives an account of some experiments in this direction in the *Photographische Correspondenz*. In 1891 he gave some formulæ for hydroquinone and caustic soda, with addition of ferrocyanide of potash as accelerator. The special advantages were the highly efficient use of the hydroquinone and the energy of development, unsurpassed by any other method. Since then metol has been placed on the market, and is to be recommended gelatine for the transfer, or if it is sufficient to secure the edges of the plates and films with a solution of gelatine. As there is very little enlargement of the film, sometimes scarcely any, the process might be used by photographers to make companion pictures in opposite position.—*British Journal of Photography.*

Photographing Royalty.—In the February number of the *Windsor Magazine* appears an interview with Mr. J. Russell, who tells many interesting things concerning his royal sitters. "So far as my own experience goes, the royal personages who have been good enough to favor me with sittings have always done so with the utmost readiness, and without the slightest trace of boredom. Sometimes, indeed, the occasions have been productive of the greatest merriment. A few years ago I was three weeks on board the "Osborne," taking groups every day, and frequently the sitters seemed to find a great deal of amusement in the proceedings."

"In what language are you usually addressed at foreign courts?"

"Invariably their Majesties speak English, and perfect English too. I may say that nowhere have I heard more beautiful English than that spoken at the Russian court. There was not the smallest hint of accent about it."

"Have royalty the same desire to see proofs of their photographs as ordinary mortals?"

"Certainly, and in many cases duplicate sets have to be sent to other members of the royal family."

"Do royal sitters purchase many of their own portraits?"

"Oh, yes. Sometimes an order has come in for as much as £300. They must of necessity give away a great number of the course of a year, I should think; and that is not only a fortunate thing for the favored recipient, but it is likewise fortunate for the photographer."

"For delightful personality," says Mr. Russell, "it would be difficult to find anyone to eclipse the Princess of Wales, consequently photographing at Sandringham is exceptionally pleasant work. There is such perfect naturalness, and one might almost say homeliness, bout the Princess and her daughters. They take the liveliest interest in the portraits, the grouping, and general arrangement, and the chat with such easy graciousness, one is more than sorry when it is over. The Prince of Wales, too, is most thoughtful, and remembers faces and events with wonderful accuracy. On one occasion, when I was at Coburg, the Prince of Wales saw me, and, after returning my salute, stopped and said, 'There will be a party at Rosenau to-morrow. You might get some good groups if you go,' and he asked the equerry to get a pass for me. I thanked his Royal Highness, and then went to the palace with the equerry, who then left me while he made application forthwith to the Hofmarshal. He returned, however, with the information that it was to be a private meeting, and that, in consequence, no passes could possibly be issued for that occasion. I was coming down the grand staircase again when I met the Prince of Wales coming up. 'Well,' he said, 'is it all right? Have you obtained a pass for the gathering I told you about?' I informed him as to the result of my application. 'Oh, they don't

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understand'' he replied: 'I'll go and see what I can do.' And he left me, an official bringing me word almost immediately that, if I would be at a certain restaurant, which was close to Rosenau, they would send for me when they were ready to be photographed. I did so, and was summoned in due course to take photographs of the royal personages and their guests. The occasion was a particularly interesting one, it being the celebration of the bethrothal of the present Emperor and Empress of Russia (then the Tsarevitch and Princess Alice of Hesse). I remarked to the Tsarevitch that I had had the honor of photographing him about twenty years before with his father. He replied at once: 'Yes, it will be exactly twenty years ago.' I had taken a number of plates of various groups, and at last the Prince of Wales, who had been suggesting and directing throughout, said, 'And now is there any one else you wish to photograph? I should think you have every one.' I replied that I would like to take a special plate of the German Emperor, as I only had him in a group with others on this occasion. 'The German Emperor is wanted," the Prince of Wales called out. 'Where is the German Emperor?' His Majesty came and said, 'You have taken me alone so many times before, you can't want me again!' 'But I have never taken your Majesty in that uniform,' I protested; and he laughed and consented to the ordeal."

"The first time I ever had the honor of taking photographs at a foreign court," continues Mr. Russell," was at Berlin, on the occasion of the marriage of Prince Margaret (the daughter of the Empress Frederick) to Prince Charles of Hesse. Later on, the Empress Frederick was good enough to allow me to take photographs of her house 'Friedrickshof,' at Homburg; and then I was wonderfully impressed with her pleasant unaffected bearing. She said she would like to show me over the grounds, and point out which she considered the finest views; so, throwing a wrap over her head and shoulders, she there and then took me round, and seemed to evince such an interest in every thing and to be so pleased when she saw that I was delighted with the scenery. The Empress Frederick is an exceptionally interesting sitter. Being an accomplished artist, she will go into the general details of the photographs, and herself arrange the background and surroundings with the utmost intelligence and skill, and she spares no pains to get just the effect she desires. The first time I was summoned to Potsdam to photograph the present Emperor remains very vividly on my mind. The appointment was for eight o'clock in the morning. I was in Berlin one evening when the telegram arrived, and had to leave very early next morning in order to reach Potsdam at the hour named. By a most unfortunate misunderstanding, however, the man from my hotel drove me in the morning to the wrong station in Berlin. When we got there, we found there was no train to Potsdam, and, what was still more vexatious, we had there lost the one from the other station. There was nothing for it but to wire to His Majesty, and, in a most uneasy frame of mind, I eventually reached the palace by about 8.30. The officials received me with various remarks to the effect that His Majesty was not in the habit of being kept waiting, etc., and advised me to get my camera ready with as much dispatch as possible, and then they would ascertain His Majesty's pleasure regarding my backsliding self—all of which was not particularly reassuring. As soon as I was ready, the Emperor came out (I was to photograph him in the open air in front of the palace). I immediately expressed my regret at the unfortunate delay. 'Oh, I quite understand how it happened,' he replied most affably; 'pray say no more about it.' And thereupon he began to speak about the work in hand. I was most anxious to have him photographed in more than one uniform, if possible, but hardly liked to suggest it, as it would take up still more of his time. However, he immediately consented, and, after being photographed in the uniform of an honorary English admiral, he quickly reappeared in a German uniform, and he then favored me with a sitting on horseback as a finale. When he was riding away, he turned again and said, "The Empress will let you know when she will be at liberty to see you.' Later on, a telegram came to my hotel, naming the hour when Her Majesty would be disengaged. When I arrived again at the palace, she herself took me through various rooms, in order that I might select which would be the most advantageous for the photograph. Then she suggested various flowers which she thought would look effective, and she had them brought, and arranged them experimentally. She was very bright, and chatted most freely concerning the photographs."

Doctoring Negatives.—One of the phrases most commonly heard at this period of the year is—"Now is the winter of our discontent." The perversion of the saying to photographic purposes no doubt originates from a sense of failure in striking the balance of the past season. For, as a rule, we are too busy in spring, summer, and autumn, to do more than simple exposing with occasional development, and it is only in winter, "when the dismal rain comes down in slanting lines," that the loss and gain of our operations are reckoned, and the doubtful are either struck off or fortified. Generally the last proceeding is the occasion "of our discontent," but it should no longer be so if the following directions, given by leading Continental workers, are closely followed:

Development of over-exposed plates.—For the rectification of the effects of over-exposure the plan usually followed is either to use an old developer with a strong dose of bromide, or to employ a very slow-acting reducer of the silver haloid acted on by light. But it may sometimes happen that the over-exposure has been so excessive that the ordinary methods are inefficacious, and in such cases H. Schmidt, in the *Phot. Rundschau*, advises an entirely new procedure. "It is well-known," he says, "that light acts on the silver salts of the sensitive plate in two ways, one modifying the physical and the other the chemical quality. By means of the chemical change, the undissolved silver bromide is under the action of the developer reduced to metallic silver, whereas the physical modification, taken advantage of in the wet collodion process, confers on it the power of attracting from an acidulated solution of silver nitrate, to which has been added a reducing reagent, the particles of metallic silver formed during the decomposition of the mixture. With gelatine dry plates, development is based on the chemical decomposition of the silver haloid, since their physical alteration is too weak to be profitably employed. This latter is, at least for chloride and bromide of silver, so much inferior to the chemical

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change that, if, on an exposed plate, chemical development would produce an over-exposed looking image, physical development would give an apparently under-exposed and harsh negative. By intelligently combining, however, the two processes, it is perfectly possible to obtain, from grossly over-exposed plates, negatives that are technically perfect. Before developing always have ready at hand a solution of 77 grains (5 grammes) of silver nitrate in 3½ ounces (100 cc.) of water, and if on the application of the developer the image flashes up indicating over-exposure, immediately remove the plate from the dish, and, after washing it well, place it in the nitrate of silver solution for a few minutes. Then take the plate out, wash it well a second time, and replace it in the developer, rocking the tray steadily. The image will now be seen to gain strength slowly, and when the desired intensity has been obtained the plate is fixed in the usual way.

In most cases of very considerable over-exposure, negatives developed under such conditions will require further intensification. For this purpose any one of the strengthening methods commonly employed will serve, but nothing can equal the following intensifying bath, which is applied before fixing. To make it, prepare two solutions. A.—Pyrogallol, 10 grammes, or 154 grains; alcohol (ninety-six per cent.) 100 cc., or 3½ ounces. B.—Silver nitrate, 2 grammes, or 31 grains; citric acid, 3 grammes, or 46 grains; distilled water, 100 cc., or 3½ ounces. These two solutions are to be kept separate till they are required for use. When required, dilute 4 cc. or 68 minim of A with 3½ ounces of water, and add to it 68 minims of B. The negative, well washed, is placed in this bath, and when the required intensification is attained, is taken out, again thoroughly washed, and then fixed. The results are said to be excellent.

Uranium intensification.—In the same journal (*Phot. Rundschau*) Mr. R. Abegg has some very interesting and instructive remarks on intensification with uranium. In his opinion, the great advantage of uranium over mercury lies in the easy manner by which excessive strengthening can be reduced. As is well known, the uranous ferrocyanide, which strengthens the silver image of the negative, is soluble in simple water or in water containing a little ammonia; but in taking advantage of this property to reduce intensification, it is necessary to proceed very cautiously, as, for reasons that will be found further on, if the reduction is carried too far, reintensification is impossible. Since ammonia is an exceedingly energetic solvent it should never be employed save when the weakening required is great, and then it should be used considerably diluted with water. The mixing should be done before the plate is placed in the tray, because, if the plate be first placed in the dish with the water, and the ammonia then added by drops, the reduction will be greatest at the point at which the ammonia touches the water and the negative will be spoiled. Even with pure water, if the plate be placed under a tap, the intensification will be more rapidly reduced where the jet strikes the film than in other parts. For these reasons the reduction should always be effected by placing the negative in a dish of still water, which may or may not contain ammonia according to the weakening desired. There is no objection to gently rocking the dish.

Now these precautions would be useless if there was any foundation for the general belief that a uranium-intensified negative could be re-strengthened at pleasure should the reduction of the uranous coating be too much. Experience shows us that the popular belief is false, and the theory of the chemical process of intensification with the salts of uranium gives us the reason. By mixing a solution of uranic nitrate with one of potassium ferricyanide, a soluble substance, the ferricyanide of uranium, is formed. This, in contact with the silver of the image (or other reducing bodies), is reduced to ferrocyanide of uranium, which, being slightly soluble, is precipitated over the prints where the particles of silver provoke the reduction. But as every reduction causes the oxidation of the reducing body, the silver which acts as the reducer will be oxidized (probably into a ferrocyanide or cyanide), and, if by ammonia or prolonged washing, the deposit of ferrocyanide of uranium be removed, the silver remaining will, instead of retaining its original form of metallic silver, be only oxidized silver. That this is so, will be evident from simple ocular inspection, as the negative, freed from the uranous deposit, no longer retains its original density, but appears more transparent and like a negative bleached with mercuric or ferric chloride. And experiment confirms this view, for the said negative, freed from the uranous deposit, can, by development, be brought to its pristine density, showing that the oxidized silver has been reduced afresh to the metallic state. This fact explains why the negative, freed from the uranous deposit, cannot be intensified; the silver compound is incapable of further oxidation, and is unable, therefore, to act as the reducer of the ferricyanide of uranium.

From the fact just stated that by a second development the oxidized silver image may be restored to its pristine density, it might be concluded that the restored image might be reintensified as at first. This, however, is not practicable, as the gelatine, having undergone a tanning under the different substances employed, does not permit of even intensification, but gives stained and uneven images. It may also be urged that when the first strengthening was not carried far enough to oxidize *all* the silver of the image, the unoxidized remnant would naturally provoke a fresh intensification under the action of the ferricyanide of uranium. Possibly, but as the density of the new intensification would depend on the slight remnants of unoxidized silver, it will be far better to so regulate the extent of the washing as not to remove more uranous deposit than is necessary. These remarks apply also to intensification with mercury, when only negatives blackened by a developer lend themselves to re-intensification.

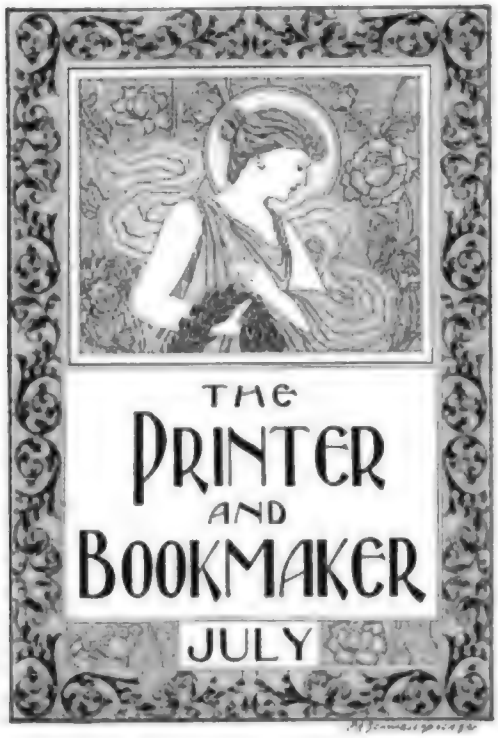
New reducer for negatives.—Mr. E. Gosselin recommends a solution for reducing over-dense negatives which, he says, will never produce marks or irregular action, and will last for ages. First soak, he says, the negative for half an hour in water, and then transfer it to a bath made up of water, 3½ ounces, or 100 cc.; sulphuric acid, 68 minims, or 4 cc; three per cent. solution of potassium bichromate, 102 minims, or 6 cc. This bath is very energetic, particularly when fresh, and, should, therefore, be used cautiously. If the reduction has been carried too far the negative might be intensified.—*Photography*.

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TRADE NOTES.

Thos. H. McCollin & Co., have opened a branch house, Boardwalk and Michigan Avenue, Atlantic City.

Wuestner's New Cyclone Plates are very rapid and quick developers. You can get them of any dealer. Scovill & Adams Co. has a full line.



In our July Issue we gave a reproduction of a picture entitled "The Terrace, Central Park," giving credit to *The Inland Printer*. The cut was kindly loaned us by *The Printer and Bookmaker*, a bright monthly, published in the interest of printers and bookmakers. Each issue is bound with a different cover, always attractive and up to date. A reproduction of the July issue is given above.

Mr. A. P. Yates, of Syracuse, N. Y., official photographer of the N. Y. Central R. R., says: "I cannot speak too highly of your Bichromate of Potash Ray Filter. It is not only a success but a *photographic necessity*. I use it daily in my landscape work." Some of Mr. Yates' fine pictures are reproduced in "Rayfiltergraphs," sent free by addressing Department "H," Bausch & Lomb Optical Co., Rochester, N. Y.

The Bausch & Lomb Optical Company celebrate the twelfth year of their production of photographic lenses by the extension of their photographic lens department, the new addition covering 8,000 feet floor space and providing facilities which the rapid increase in the demand for their lenses has made imperative.

NOTES ABOUT PHOTOGRAPHERS.

John Bartlett will edit the *American Journal of Photography*.

John Carbutt is now manufacturing films for animated picture machines such as the Biograph, Vitascope, etc.

W. G. Thuss has been compelled, owing to other duties, to resign his position as 2d Vice-President of the P. A. of A. Mr. R. P. Bellsmith of Cincinnati has been appointed in his stead.

Taber, the San Francisco photographer, has opened up a bas-relief portrait studio in London. It appears that these portraits are becoming very popular there.

Professor W. Hallock has perfected his instrument for photographing the human voice. Some account of his experiments will be found in the 1896 "American Annual of Photography."



J. CRAIG ANNAN.

J. Craig Annan recently gave an exhibition of his work at the Camera Club, in London. Every picture he makes is a work of art.

Alvan G. Clark, the celebrated telescope lens maker and astronomer died recently.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF MAY, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

583,700. Photographic Shutter. W. V. Esmond, New York, N. Y., assignor to the E. & H. T. Anthony & Co., of New York.

A main and supplemental shutter wings are mounted on the same pivot, the supplemental wing being rigidly attached to the pivot, steps being formed on the main wing to limit the movement of the supplemental wing. A thumb-nut is provided to operate the pivot, and a separate spring for each wing is provided, whereby said wings will act independently of each other. Means are provided to actuate the main wing and a catch is adapted to hold the latter when at the limit of its movement, said catch being operated from the exterior of the shutter casing.

583,836. Photographic Camera. Max Bauer, Jersey City, N. J.

A photographic camera having a base provided with a way is constructed with an angularly adjustable back movable along the way and having a spring-pressed locking-pin for engaging a part of the same. A slide having an incline at one end is constructed to pass under and raise the locking-pin from the way when the said slide is moved toward said pin.

584,182. Copying Camera Stand. Owen Linley, London, England, assignor to F. O. Scott, same place.

In connection with a copying camera which is bodily movable away from the copying board and wherein the focusing is effected by a movement of the camera front in a plane parallel with the copying board, the inventor employs gearing connecting the camera front with the sliding copying board, whereby the copying board is shifted in its own plane in co relation with the focusing motion so as to maintain constant during the focusing the pre determined position of the picture on the focusing screen and enable the camera to be adjusted for dimension and focusing of the picture while continuously viewing the picture on the screen.

584,550. Process of Producing Relief Effects. J. Jacobson, Boston, Mass., assignor to W. R. Lambert, Cambridge, Mass.

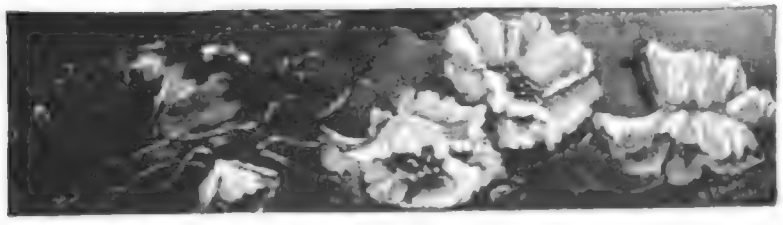
This invention is a photographic plate comprising a base portion of flexible substantially non-elastic material capable of being shaped by pressure brought to bear upon it and having sufficient rigidity to retain the shape thus produced. This plate is provided with a surface film of sensitized gelatine adapted to have a relief image produced thereon by photographic exposure and subsequent soaking in water.

584,862. Manufacture of Photographic Film George Eastman, Rochester, N. Y., assignor by mesne assignments to the Eastman Kodak Co., same place.

This is an article of manufacture which is described as being a photographic film consisting of a non-electric transparent or translucent support containing a nitrocellulose compound and a superposed coating sensitive to the action of light.

585,452. Photographic Printing Paper. Wilhelm Schröter, Frankfort-on-the-Main, Germany, assignor to Fabrik Technischer Papiere Arndt und Troost-same place.

This is a process for manufacturing a highly sensitive photographic printing sheet, which consists in soaking a paper or textile fabric free of chlorine with a solution of silver nitrate and iron ammonium citrate, to which is added free tartaric acid to redissolve the precipitated silver citrate.



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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

SEPTEMBER, 1897.

Number 9.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN-ILLUSTRATED MONTHLY-MAGAZINE DEVOTED-TO-THE-INTERESTS-OF-ARTISTIC & SCIENTIFIC-PHOTOGRAPHY.



THE-PHOTOGRAPHIC-TIMES-PUBLISHING-ASSOCIATION-60-AND-62-EAST-11TH.-ST.-NEW-YORK.

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VOL. XXIX. SEPTEMBER, 1897. No. 9.

AUTOBIOGRAPHICAL SKETCHES.

BY H. P. ROBINSON.

CHAPTER IV.

"Home-keeping youths have ever homely wit."
—*Shakespeare.*



THE OILCLOTH DARKROOM.

THE THOUGHT occurs to me that it is time I got away from Ludlow, and out into the to me unknown world. It will not do, I am afraid, to say with the Baker in "The Hunting of the Snark," "I skip forty years," but I will hurry through some few of them, but before I do so I must mention two books which have had more influence over me as an artist than any others. The one sent me direct to nature for everything, the other taught me that nature was only the foundation of art. The one corrected the other. In the year 1843 was published "Modern Painters," Vol. I, by a graduate of Oxford, and a copy was give to me the following year by a kind friend. This prodigious volume, written by a young man of 22 or 23 years of age, received by the critics with hostility and contempt, kindled enthusiasm among thousands who had previously cared as little as they had known about art, and had completely revolutionized public opinion about landscape painting. I knew nothing at the time of what was thought of the book outside of my narrow boundary. Even at that early age I had read much in the history of art and remembered how shocked I was to see in this revolutionary volume disrespectful remarks on the old masters, but soon become a convert. In that volume Ruskin had created an epoch in art criticism. The ideas were new, and the language in which they were given such as had never before been applied to art. There was no amateurism about it, it was the work of a master in poetical prose. I may truly say that I have read this volume for more than fifty years, and it does not lie quietly on its shelf even now. The author makes the youthful mistake of confounding nature with art, and in stating that art could be learned straight from nature. Art is not spontaneous, it is the slow growth of centuries. That is why a photograph pure and simple can never be a work of art. It is the fashion at present to depreciate Ruskin, perhaps he may have done something to partly deserve this in his later writings, but his early works will always be held in reverence for their perfect English, sound novel opinion, and the influence they have had in promoting the good of English Art and the welfare of English artists.

The other book I refer to was "Burnet on Composition." This book is now scoffed at by young painters as "conventional" and mechanical, but as William Morris used to say, "There seems now an idea that there need be no con-

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ventions, but this is wrong, and even when people have freed themselves from the old conventions they can become slaves to conventions of their own. I don't see any harm in conventions as such, provided they are right." Anyhow if Burnet is wrong then artists of all ages have been wrong; his opinions were built on a study of their works.

After my apprenticeship, as before it, I was allowed one year for study. I am not sure that I used it properly; perhaps there was too much cricket and fishing, and far too much sketching as a luxury instead of as a study, (for we can waste our time even in apparently good work, as those photographers do who are always playing with their scales and weights and actinometers) but I spent a good deal of the time with Mr. Penwarne, and that was a liberal education in itself.

When a youth leaves home for the first time it often depends on the hands he gets into whether he goes to the good or the bad. He often has no choice and must take what comes. Here again fortune favored me.

In November, 1850, I left Ludlow for the first time and went to a situation that had been obtained for me at Bromsgrove. I had no reason to expect other than "the usual thing" in the bookseller to whom I was engaged, but it was my good fortune to find a very exceptional employer. This was Benjamin Maund, F.L.S., a well-known botanical author as well as bookseller. He was the writer and publisher for 25 years of the *Botanic Garden*, an expensive monthly periodical with beautiful colored (by hand) plates, and other fine botanical publications, extending over a long period, and well-known in the learned world. This was prodigious luck for me. If I could have afforded it I would have paid well for such employment.

I should like to say a good deal about the kindness to me of Mr. Maund and his family, but I must not linger. I was just of the nature that would be miserable at leaving home, and they were the right people to alleviate that complaint. I stayed nearly a year with them, and it was then considered that I must have further experience in my business, and I went into one of the big publishing houses in the "Row." I got to London in time to see the Great Exhibition in 1851.

When I was at Bromsgrove a Daguerreotypist came to the town for a few weeks. I made his acquaintance and learned the process. He took what I then thought a fine large portrait of me as a specimen. We could not afford to keep our own portraits then, the silvered plates were too expensive, so I do not now possess what I should have greatly valued. I have never been able to remember this photographer's name. I wonder if he is still alive, and perchance one of our veterans; it is just possible he may be one of my personal friends, unknowing.

It is a strange thing to me that I remember nothing concerning photography during the time I was in London except the two or three show cases of Daguerreotypes. Specimens of the new collodion process, I learned afterwards, were to be seen in the International Exhibition.

It has always been a source of very great regret to me that I never saw the first exhibition ever held of photographs. This took place in the great room of the Society of Arts in December 1852, was open for several weeks, and contained 700 hundred examples. This exhibition led to the formation of the Photographic Society. However, I saw the second collection that was sent round the country, and contained many of the photographs of the first display.

I was engaged as a book collector and it was my duty to "go west" every day. This afforded me a grand opportunity of learning that part of London and something of what it contained. My knowledge of at least the titles of books soon became abnormal, good memory and great interest were of immense service. It was easy to see all the exhibitions of pictures; there were only two or three of them. The National Gallery was a small institution containing not more than 300 or 400 pictures. As I passed on my rounds each day, I often entered, and got off, as one may say, every picture by heart, and as each addition to the gallery has been made up to the present time, I have made it my business to learn all I could about it, and it astonishes me what a number of unknown old masters seem to be discovered every year! The Vernon Gallery was exhibited at Marlborough House, then in their season came the show of the British Institution and the Society of British Artists. But the most interesting exhibition of them all was that of the Royal Academy. The exhibition of this year was the culmination of the Pre-Raphaelite movement. In it were shown an unusual number of ever memorable pictures such as Millais' "Huguenot" and "Ophelia," Holman Hunt's "Hireling Shepherd," "Maddox Brown's "Jesus Washing Peter's Feet," now in the National

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Gallery, and Collins' "May in Regent's Park."

To the exhibition of this year I had the fortune to have a picture admitted, due I am afraid to my usual luck rather than merit. The occasion was rather curious. Two days before the sending-in day I was spending the evening with three young artists, and we agreed to each begin a picture and send it in. When I got home I painted nearly all night, and all the next day. We sent the pictures in, and mine was the only one accepted. Of course I had the usual privilege of exhibitors, a season ticket, and an invitation to the conversazione. It was at this soiree that I saw the Duke of Wellington. He was being taken round by Sir Charles Eastlake, who was then President.



DR. H. W. DIAMOND, F. R. S.

My object being experience rather than anything permanent, I left London, and went home for the winter. In the spring of the next year I went to Brighton. I was a complete failure at Brighton, and my employer did not hesitate to tell me so. He said: "I like you personally very much but I want a man who can *sell* a book, it is for the buyer to know all about the inside, not you. There's my old partner at Leamington, you will suit him, and he wants a man." I went. Another of the decisive turning points. I *did* suit him, and remained with him until I began business as a professional photographer in January, 1857, making many friends who interested themselves in my pursuits. Here is a curious instance of the vicissitude of things. Among others a gentleman of the fine old-fashioned type, John Hampden by name, a direct descendant of the patriot, and brother to the then Bishop of Hereford, often invited me to his house. At the auction sale of his effects after his death I bought two old swords for eighteen pence. One of them a very fine rapier, I some years afterwards gave to my friend Hain Friswell, who read a paper on it at the British Archæological Association. When he died this sword sold by auction for £60, there being good reason to suppose it really was "the sword of Hampden." Up to this time I had made very few experiments in photography. I now began a more systematic practice. I became possessed of a treasure, nothing less than a set of Daguerreotype materials. But Daguerreotype was dead, collodion was triumphant, professionally, however, almost entirely confined to the positive process, a method I never practiced. The one professional in the town had never heard of negatives and positives, I had taken in the *Journal of the Photographic Society* since it commenced in 1853, and worked the calotype process, from Dr. Diamond's directions in No. 11, and have still some dozens of negatives by that process. In the second number, however, was a very practical paper on the collodion process by Count de Montizon, and from that excellent paper I worked with success, sometimes making my collodion, but oftener getting it a few ounces at a time from Horn & Thornthwaite.

Then I bought a 6 x 5 collapsible callotype camera which had to be altered and got ready for a lens when I could afford one. It came, as everything comes if you wait, and I only waited a year, as will soon be seen.

Everything else, except the business I had to attend to, was now given up for photography. Even drawing and painting had to go as well as most of my reading. It was soon evident in my lodging that I had become a dangerous lunatic, and there would be nothing left to destroy if strong measures were not taken. So I was turned out of the house, but it was only

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into the garden, where I was allowed to build a small dark-room of oil-cloth.

There was more need for experiment in the early morning of photography than there is now and I tried most of the known processes, even to the making of most of my chemicals.

Now it was that one was wanted who was, if I may so put it, in the thick of photography, to wake me from my pottering, and start me on the road. Dr. Diamond turned up as the good influence that was to impel me in the right direction.

It was, I think, in 1854, that Dr. Diamond, then on a visit to Leamington, had his attention directed to some little groups of children that I had done and sought me out. From that day I looked upon him as my guide, philosopher, and photographic father.

Before I go further I must have a word about Dr. Diamond, he was much too remarkable a character, and was too good to me to be allowed to be taken incidentally only.

Almost as soon as calotype was given –or rather patented—to the world, a group of amateurs sprang up who seemed most fitted to carry it forward. The names of Fenton, Delamotte, Bedford, Shadbolt, Turner, Owen, and others, will be remembered. Chief among these was Dr. Diamond. For many years his residence at the Surrey County Asylum at Wandsworth, of which he was Superintendent, and afterwards at that delightful old mansion, Twickenham House, was the weekly gathering place of a large circle of literary, artistic, and antiquarian friends, to which, when their time came, were added the photographers, and it was this group of photographers that was mainly instrumental in forming the Photographic Society in 1853.

I must remember that I have only room here for a few bare facts, and must content myself with saying that Frederic Scott Archer, the sculptor, and discoverer of the collodion process, was a patient of Dr. Diamond, and received much assistance from him in working out the process. For ten years the doctor was Secretary of the Society, and editor of the journal. On his resignation of these offices he was presented by the President and Council with an illustrated address and the medal of the Society. The Lord Chief Baron, Sir Frederick Pollock, in making the presentation made the finest compliment such a man could offer to another. He said, having lived a long life, if he was called upon to name ten gentlemen whom he had known and whom he wished to have known, Dr. Diamond would be one of them. A true appreciation also is contained in the following words. When J. Cordy Jefferson wrote his popular "Book about Doctors," he recorded those to whom he was indebted, and thus mentioned Dr. Diamond. "But even more than to the librarian of the College of Physicians the writer is indebted to his very kind friend Dr. Diamond, a gentleman who, to all the best qualities of a complete physician, unites the graces of a scholarly mind, an enthusiasm for art, and the fascination of a generous nature."

This was the man that crossed my path at the right time. I was now twenty-four, and it was time I decided what to do with myself. I did not care for trade; I had had so much disappointment in getting forward as a painter that I was discouraged; and here was photography as a possible profession. Dr. Diamond pointed out to me that such enthusiasts as myself were wanted in professional photography, that I should not be in a hurry, but carefully train myself for the pursuit from all points of view, and he very clearly showed me that photography should be a very different profession from what it was or promised to be, and if I would devote myself to it he would help me as much as possible. From that day my life has been devoted to photography as a business and as an art, a hobby, and a devotion.

More than two years elapsed before I went into business. During the interval I read all I could collect on the subject, practiced on every possible occasion, and spent all the time I could afford at Dr. Diamond's house at Wandsworth. Drawing had to be neglected, or was only employed to design pictures which could be executed in photography. At this time I published a few whole-plate focal views. These were the first that had been done at Leamington on collodion, and sold freely at four shillings each.

In the initial of this chapter will be found my photographic establishment of the time, an oil-cloth dark-room, with myself and a little model, who was afterwards of immense use to me (luck at the right time again!), and indeed to her assistance I owe much of my early reputation. She was the dying girl in "Fading Away," and still lives.

Going into business deserves a fresh chapter.

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NOTES ON THE NUDE IN PHOTOGRAPHY. BY CARL RAU.

While some notice is being given of late to the nude in photography, it would be of considerable value to those somewhat interested in this branch, to hear the views of photographers of experience along these lines, and hope that during the year, we will be favored with some practical hints by competent workers, on this delicate subject. The objection of certain classes to the nude in photography, as well as in painting, will, no doubt, always be felt, however I doubt whether these objections are likely to become more pronounced, but am rather inclined to the view that they will lessen and become weaker as the skill of the photographer increases and a knowledge of the beauties of the human figure becomes more general.



THE GATHERING STORM — BY GEO. D. FIRMIN

It is to be regretted that many of the examples of the undraped figures, now and then brought to our notice, are not only quite uninteresting but also anything but beautiful, and fall far behind similar examples in painting and sculpture, yet the fault is not so much with the subject, but is rather to be found with the photographer in not choosing or possibly in not being able to obtain proper models, and especially in not being skilled enough to pose and arrange undraped figures properly. Special stress should be laid on the posing, which is one of the most difficult tasks the photographer can undertake, and which must be done artistically and properly to make the result acceptable. It is difficult enough to pose a fully draped figure, especially a man's, in a pleasing and graceful manner, but infinitely more so, if the figure is undraped. Almost if not entirely perfect figures can be found everywhere and in a larger proportion than we would take it for granted after reading so much about the ideal, etc., however, such really good figures cannot always be secured to pose, especially before a camera; and right here another great difficulty presents itself, particularly to those living in smaller cities, away from art centers.

For really good examples in photography from the undraped figure the work of the late Sarony stands almost unsurpassed and will prove beyond dispute, that photographs can be taken from living models, that will hold their own with productions by painters and in fact, come up so fully in every particular to all reasonable requirements, to satisfy the most fastidious critic. The nude can only be rendered successfully by a truly refined artist, whether he uses brush or camera, one with a pure mind, who understands and loves the grace and beauty of the human figure, and who has an eye or so to say "intuitive feeling" for beauty of form and grace of outline. To this must be added the utmost skill and knowledge in posing, so as to bring out the best features and hide imperfections. For these reasons there will at best always remain but a few, really competent to essay the nude, while the great majority of photographers will of necessity be forced to drop the subject, at least as far as public exhibitions or displays of work are concerned.

FINE ART.—Fine art, says Ruskin, is that in which the hand, the head, and the heart of man go together. This is a good maxim for photographers, who are apt to think the head and hand are all sufficient.

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TAKING PHOTOGRAPHS AT NIGHT. BY DR. HUGO ERICHSEN.

AFTER carefully reading Mr. W. A. Fraser's admirable article on night photography in the April number of this periodical, I gathered up sufficient courage to essay a trial in this direction, and brave the ridicule of fellow men.

My first experiment was made one evening after a rain, and I was delighted to see the fine reflections on the pavement, and to think how they would improve the artistic appearance of the picture I was about to take.

I selected a non-halation plate and gave it a ten minutes' exposure with a full opening of the lens, a rapid rectilinear. On developing the plate I found—nothing. The plate was evidently too slow.



AFTER A STORM ON THE INDIAN OCEAN BY A. PIERRE

About a week later I made a second effort to secure a night photograph which was more successful. This time I chose an ordinary fast plate, and did not back it, but was careful to exclude near-by electric lights in my exposure, which was seven minutes in length. For the object of my picture I took the central M. E. Church on Woodward Avenue, the main thoroughfare of Detroit, and for all I know this was the first night photograph ever taken in the City of the Straits.

Annoyances were plentiful. It was a clear moonlight night, and there were pedestrians galore. My experience with them was similar to that of Mr. Fraser. All kinds of questions were asked. One fellow wanted to know if I had discovered some new kind of a plate, with which photographs could be taken at night. At one time my camera was surrounded by seven urchins who made me decidedly uncomfortable with their remarks, by no means *sotto voce*. But like all photographers, I am endowed with a good deal of patience. I gave them the desired information, and then bade them move on, which they did. Needless to say I drew a deep breath of relief.

But human beings were not the only annoyance. Every three minutes an electric car whisked by, and of course, the lens had to be covered. Once a carriage came along carrying a light. An idiotic bicyclist stopped fifteen feet before my camera, and lighted a cigar, but fortunately I had seen him coming and my plate was safe.

The photograph was taken between 8 and 9 P.M., on a Sunday, as the church is illuminated at that time. On the picture the lighted windows can be seen under the trees. The bright moonlight greatly increased the contrasts and an electric light on a tower diagonally opposite the church shone full upon the spire, and made it stand out prominently. The trolley wire in the upper part of the picture, I am sorry to say, could not be excluded The plate was developed with a weak metol and hydrochinone developer.

In conclusion, I want to say that I consider night photography a fascinating pastime, despite its drawbacks, of which the small boy is by no means the least.

SHE.—Have you really seen that wonderful set of pictures that Miss Leftover has had taken, one on each birthday?

HE.—Yes; but they're very indistinct. You see the photos have faded at one end of the list, and the subject at the other.—*Truth.*

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From Photograms of '97.

DEAD WATERS

BY ROBERT DEMACHY

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THE SOUTH LIGHT. BY H. G. ROGERS.

THE doctrine that good portraiture can only be done under a skylight which faces north, is one of those doctrines which we believe in only because we are, as a general rule, very much like sheep which follow their leader and lack the courage to strike out for themselves. To be content with statements without seeking for the underlying reason is a very unwise proceeding, especially is it reprehensible because the craft is a headstrong one—headstrong in the almost universal propensity to follow in the tracks of those who are doing something and lamentably wanting in the sublime confidence that in the great unknown there are many undiscovered treasures. We are apt to continue to build skylights with northern aspects for the very bad reason that our predecessors (who make good pictures) never built them in any other way. Of course the construction of a skylight is an expensive undertaking, and few there are who can run the risk of finding a white elephant on their hands after the mason and the caustickmaker have turned over the premises to the owner. But if we never get the chance to strike out in a new direction we shall never progress on that coveted object, *the novelty* will ever evade our search.

It befell me some time ago to be obliged to take a "studio" with a southern exposure. The "studio" was not a photographic gallery, it was not a painter's studio for the painter pre-eminently requires a north light. The room which I took possession of was large as regards floor space, it had an immense glass area on the south side, and there was nearly a whole square in front which was vacant, permitting the light and the sunshine to stream in uninterruptedly. The amount of light gave promise of innumerable possibilities in the future; I thought of the quick exposures I should be able to make, and a panorama of sitters slowly passing before the camera, and "being taken without their knowing it," became a dream of delightful anticipation.

When I first saw the place it was a cold winter's day, the sun made it very cheerful and warm, and indicated that health and comfort abided therein; the air was *alive*,—everyone knows how insupportably dreary the air of a gallery becomes when day after day and year after year passes and the air is becoming more and more devitalized through the want of sunshine,—here there was a great vibrant volume of life-giving light, but alas! it was making broad and long patches of brilliantly reflecting surfaces on the floor which appalled me. I knew that there would be high lights in the eyes of the sitter, destroying all expression and producing "effects" which would be an abomination in every respect. There was, however, no alternative, the studio was mine, the experiment had to be undertaken, the location was most desirable because of certain facts, and to draw back was to admit defeat. I moved in; an unbelieving fellow-craftsman paid me the honor of a visit and was unkind enough to laugh when he saw the camera standing in the sun. It certainly did look rather out of its element, and seemed to resent its unaccustomed conditions after having seen nearly ten years' service under conventional circumstances. My friend made a number of irritating remarks, interspersed with mild profanity which cannot be here repeated, and finally suggested that he bring in a painter's model who he knew was at that moment obtainable, and who would pose



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THE RIVER WALL BY A. HORSLEY HINTON

for me to show me what a fool I had been to choose such a light. The model was forthcoming and my friend posed him as he saw fit, instructing him to sing me a ribald song, and placed in his hands an article of domestic use which he assured me I would shortly have to use. The resulting picture is herewith appended and fully demonstrates the unadvisability of using a southlight without brains and aids. What the aids were and how they were brought into operation by means of the brains and what the results were, may be given in a future number.

NATURAL GROUPING.—Ruskin has analyzed this matter, and arrives at three guiding laws or principles:

(1) That every portion, part, or member must depend on every other portion in order that we may have the feeling of pleasantness.

(2) That this independence requires that the several component parts shall have some differences of size, form, etc., etc.

(3) That there must also be some sort of balance or arrangement or subjection to a law of order in those parts which are possible to human interference.

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COMPOSITION. BY G. DAVISON.

III.

THE misuse or misunderstanding of the word imitation and the true value of the assertion that the representation of "things as they are" cannot result in artistic composition, are even more plainly illustrated in a consideration of the conditions of portraiture than in landscape instances.

In essence artistic composition is the same in the one class of work as in the other, but this is often disputed or misunderstood and a word on this point will be added later on.

Portraiture must concern itself chiefly with imitation, in the sense of personal pictorial expression. In a likeness, then the person must be depicted as he is, that is as he seems to us, in the way we think the character best shown and the aspect of the figure most natural. And cannot such a result be artistic in composition? Surely the limitations here for the photographer are very few indeed of an absolute nature. By one who really sees and knows, the camera can be used effectively in time and circumstance. If the photographer have the necessary sympathetic influence over the sitter, such as the painter portraitist himself should possess, with the proper power of perception and the ready and complete mastery of technique as to light and tone rendering, it is difficult to understand what is lacking for the particular purpose, save color.

Any draughtsman should put into the portrait of a face more than could ever be expressed by that face at any one time is plainly absurd. Such a procedure implies a new face and character, and is not portraiture.

The fact really seems to be that the pencil cannot compass the difficulties of complete presentment of the human face. At least the deficiencies of handwork as a recorder are more plainly seen in portraiture than in most classes of subject, and it is there that the perfection of photography as draughtsman is most evident. Even in the many self conscious photographic portraits which are published, we seem to be able to see more of the individual in more natural guise than in the best of drawn specimens.

A line drawing of a tone sketch may hit off a characteristic expression forcefully and exquisitely, but the charm consists greatly in the simplicity of the means of suggestion or in an accent verging upon caricature. The interest here is greatly for the expert or the connoisseur in the particular art. Its value from the pleasure it affords is not to be denied, but in portraiture the complete form, tone and texture record are of greater importance.

It has been suggested early in this article that the case is much the same in natural graphic landscape as in that portraiture, and in both it is chiefly an artistic likeness that is required. But some of those devoted to studio work do not admit or see this, and have seriously contended that composition is possible only in portraiture and figure work. To them the landscapist has his picture all ready made for him, and he is only a mechanical draftsman.

Similarly there is a disposition with some



EXAMPLE I.

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EXAMPLE II.

workers to limit the personality of the art in photographs to such alterations of the original plate or print as are brought about by hand-work or other special treatment.

The only satisfactory attitude is to judge by results and intention. Art lies in the perception and in the power of expression. Whether the selection depend upon waiting and seeking, or combination and treatment in landscape, or by actual disposition of blinds and shifting of a model in portraiture, the principle is the same.

We have to learn by work and observation of nature and of examples. There is the necessity for constant study of individual instances and effects, of attitudes and aspects suggesting character, the play of expression upon faces, the effects brought out by changes of lighting, the influence of point of view, the decorative importance of the disposition of spaces and of lines of dress and drapery, the massing of foliage or arrangement of cloud forms, the relation of the background, and the many other relations of parts in regard to definition, tone, proportions and comparative interests generally. The necessity for the study of composition is the same whether it be in portraiture or in landscape work.

But whatever the similarities or the differences in the two branches, it is certain that the power of good composition is plainly seen in many cases of masterly portraits that have been achieved. In these the pose fits the individual, the lighting gives the play of muscle—that appearance of the ins and outs of the face which means "nature," and is called good modelling — the background comes together with the figure in a way signifying artistic control, the boundaries suit the attitude and circumstance not only with the negative merit of absence of awkwardness, but with intentional fitness, and the whole is marked by a sense of proportion and by general harmony of line, light and character. It would be difficult to find a better example to point this moral than Mr. Annan's portrait of Mr. S. R. Crockett, a presentment of which has already been given in a previous issue. Many of Mr. Hollyer's portraits, not least that of himself, also furnish the same quality of fine composition, and there is generally a well-marked increase of late in the number of creditable portraits and a bigger crop of fresh unconventional work in this most fascinating field of picture production.

As already argued, it is after all, even in landscape, a good artistic portrait that is wanted. Unfortunately the word portrait has acquired something of the meaning of a mechanical commonplace transcript. But that is not the use of the word intended here. That which pleases first and most in graphic representation of natural landscape is the truth and vividness of the natural feeling expressed. Just as in portraiture, so here it is the subtle seeing and seizing of character, as well as the secondary decorative appeal. The word composition is often limited in its application to this latter subordinate function of pictures, even of those which are evidently and frankly natural

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in aim. This leaves out of reckoning the pleasure in the particular subject for itself and the pleasure in the effective presentment of the feeling of nature, relative form, color, tone, definition and so forth, all of which are the result of intention and composition. It is, of course, possible for any one of these three graces to be made more conspicuous than the rest in pictorial illusions and all tastes are thereby met.



EXAMPLE III.

It is, however, evident that the decorative message is that which is most rare in any original and forceful form in photography. The interesting topic and the well planned scene have been achieved, the unprincipled popular violent effect, sad to see, and the successful rendering of rare light and atmosphere are not uncommon, but the binding of these together in a decorative scheme is very rare. Nevertheless, the use of natural material chiefly for a decorative design, a line and tone pattern or harmony, and secondarily as a landscape, is a legitimate field of work and instinct with special charm. It may be safely urged upon photographers that the lack of intentional arrangement or original composition constitutes the chief weakness of the photographs in the pictorial exhibitions of the present time.

The examples which are appended to these notes may be taken as in some slight sense illustrating a few of the points which have been referred to. The first, that of a canal boat and figures in a landscape, furnishes an illustration of an early effort to make an outdoor subject picture in which the figures and incident are slightly more prominent than the landscape. There has been much rubbish written about the added pleasure of life in landscape and the necessity for human interest in the highest class of work. That or natural perversity has led to the perpetration of many horrors in the way of hurriedly devised groups and hunted-up accessories, pitchforked into a scene "to make a picture." The possibility of pure landscape being sufficient for subject, sentiment and decoration had to be stoutly fought by precept and example, and although there are still some who echo the old formula, exhibition walls amply prove that there is no need to reopen the controversy. A preference is permissible, but the man that cannot appreciate the poetry of a Corot must be without genuine knowledge or feeling. Such an one is of the same kidney as the critic who, writing of Mr. G. F. Watts's allegorical work, says: "He has painted a good many portraits also, because a portrait is 'the window of the soul,' but no still life, no landscapes, because landscapes prove nothing." As though a picture ought to be a proposition in geometry or art, a teacher of history and morals.

As a composition the example is, in most particulars, a warning to avoid scattered interests and hard lines, the only good quality evident in the original being an effective suggestion of the misty atmosphere of a hot, sunny morning.

The second illustration, a photograph of old piers and hulks on a mud river under a highly ornamental sky on a quiet afternoon, is in its present state, rather a nightmare to the writer. It serves with the third example, "Saltings at

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Sunset," to point the remark as to popular violent effects, types of pictures calculated to arrest the attention of the many rather than the approval of the few who know.

These photographs, produced respectively eleven and eight years ago, may be taken as representative of a good deal that we have seen then and since, where blatant effect rather than truth and delicacy of tone and harmonious decorative arrangement are sought for.

The last picture is, however, saved from the depth of wickedness we have sometimes seen in kindred examples, by a certain harmony between the fantastic foreground and the glory of the sunset. The rays striking across the water to the point to which the tidal ditches converge hold the composition together, and, in the original, whatever there may be in the reproduction, there is something of the feeling of wildness, vastness and mystery induced by the natural scene.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER II.

LENSES.

If the reader should know nothing of light and optics, we recommend him to get Ganot's Physics, and thoroughly master Book VII., on "Light." This may seem a little formidable, but our reader will find that with a very simple knowledge of mathematics he can easily understand all the fundamental sections, and it is our opinion that light and chemistry should be studied directly from systematic text-books that treat of those subjects. In the Appendix we shall refer to some additional books which we consider advisable for the student to read, but for the present we strongly recommend him to thoroughly master the parts of Ganot that we have cited, and to avoid all other desultory reading until he has done so.

Far too much time has been given, and far too much importance has been hitherto attached to the subject of optics in connection with photography. Much time and expense would have been saved had the pioneers of photography had good art educations as well as the elementary knowledge of optics and chemistry which many of them possessed, for without art training the practice of photography came to be looked upon purely as a science, and the ideal work of the photographer was to produce an unnatural, inartistic and often unscientific picture. It is, indeed, a satire on photography, and a blot which can never be entirely removed, that at the very time the so-called scientific photographers were worrying opticians to death, and vying with each other in producing the greatest untruths, they were all the while shouting in the market-place that their object was to produce "truth to nature" works. At length, when the most doubly patented distorting lenses were made to meet their demands, they, with imperturbable self-confidence, presented a sharp, visually untrue photograph, insisting upon its truth. "A truer picture," said they, "than drawing"; "truer than the eye sees," some said. In short, their picture was absolutely perfect. When a lens giving a brilliant picture, with all the detail and shadows sharp, and the planes all equally sharp, was at last produced, the scientists were *in excelsis*. But, alas! they often proved themselves as unscientific as they were inartistic! Had they but taken up their simplest form of lens and used it as magnifying-glass, they would have seen immediately that all was not right, and instead of clamoring for the pictoral falsities of "shortness of focus," "wide angle views," and the other hydraheads of vulgarity, they might have set to and made the lens which was required. It was but a simple thing that was required.

We shall endeavor to render this rather complex subject sufficiently clear, so that the student may know what he is doing when he uses his lenses. Difficult as it is to put this matter simply and clearly, we shall approach the subject with that object.

To begin with, a lens is not absolutely necessary to take a photograph with. Such pictures may be taken with what is called a "pin-hole" or diffraction camera. We will not stop to say how they can be made, because we consider them undesirable for pictorial purposes. The light simply passes through a minute hole perforated in a metal plate and placed over the place where the lens usually goes.

The very phenomena of diffraction, which have given the name to the pin-hole camera, are against its use. Capt. Abney has laid down that to obtain the best possible definition, for a focal length of 16 inches the diameter of the pin-hole should be .032 of an inch; for a focal length of 100 inches .08 of an inch; but it must

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be remembered that the pin-hole picture is always in focus, has great depth of focus and an angle depending on the focal length used (or distance from a plate of given dimensions) and is slow to work with.

Now it will be asked if our pin-hole can take these pictures, why use a lens? The answer is, that some very fair pictures have been taken without a lens, but since our wish as producers of pictures is to give as true an appearance of nature as we see it as possible, we must make use of lenses, because a pin-hole is not sufficiently flexible to meet our needs. For example, the exposure must necessarily be long—from 1 to 30 minutes. We cannot, therefore, take quickly-moving objects; perhaps we want good modeling and sharpness; we cannot get it, for by using the smallest possible pin-hole admissible we get flatness,* and modeling is always ruined. Then if we want brilliancy we *must* use a big orifice, but if we want sharpness with it we shall not get it, for a large hole gives us diffusion circles and consequent fuzziness.

"Well," you say, "I don't mind that." To which I reply, "That is possible, but then we must have command of the amount of diffusion circles, so as to get our differential focusing.

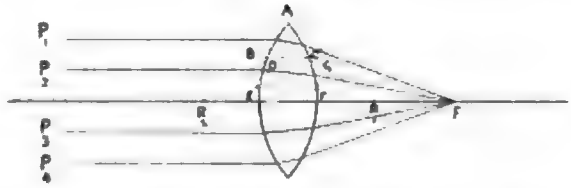
To help us in these matters lenses of all kinds have been made for a variety of purposes and objects, and we shall go into these as clearly as we can, showing the student what to avoid. Lenses, though free from diffraction, except with exceedingly small stops, must necessarily introduce evil as well as good qualities; they are essentially a compromise. We shall discuss what a naturalistic photographer must avoid.

The chief points to grasp clearly are the following: Our lenses are convergent systems forming real images; a divergent lens gives no real image. A lens for optical purposes may be regarded as an infinite number of prisms united together.

It is well known that a prism will refract or bend a beam of light out of its direct course before entering the refracting medium of which the prism is composed. The effect of such a refraction is not only to alter the course of the ray but also to split the components of white light into a chromatic beam, known as the spectrum; the most refrangible rays being violet and ultra violet, which have a powerful influence upon the ordinary photographic plate, the least refrangible being the red, this end of the spectrum, to be accurate, the yellow rays, having most effect upon our organs of sight and little effect upon the silver salts contained in an ordinary photographic plate. We shall have occasion to say something more about chromatic aberrations a little later on.

In Figure I we see parallel rays of light P_1 P_2 P_3 P_4 falling upon the lens. P_1 at the point

Fig I



where it enters the lens, is refracted or bent as though passing through an exceedingly minute prism (exaggerated in the drawing) A B C, similarly the ray P_2 is refracted by another prism in close contact D E F G. F is the point termed the focus of the lens to which all rays passing through the lens meet, provided the lens be aplanatic or without aberration, the points R_1 and R_2 are the centers of curvature of the surfaces of the lens. It will be seen that the surfaces of the prisms depicted are tangents to the radii from R_1 at the points of incidence of the rays P_1 P_2.

Figure II shows the effect of a parallel beam passing into a refractive medium, such as glass

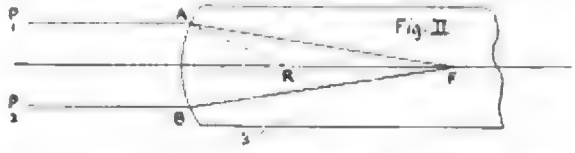
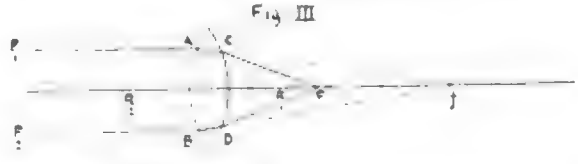


Fig. II

from which it does not emerge, the focus being formed at F, within the medium. The lenses, however, with which we deal in photographic practice pass from air into the refracting medium, glass, and emerge into air again before arriving at the focus. Our lenses then are constituted of a refracting medium or refracting media, which are bounded with spherical curves as illustrated simply in Figure III. The

Fig III



surface A B is struck from the center of curvature R and would form an image at *f* (as in

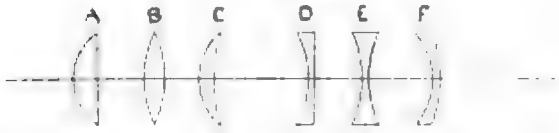
* For a given distance of plate from pinhole there is one *best* aperture to ascribe to the pin-hole; a larger or smaller orifice giving worse definition through excessive diffraction.

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Fig. II) if continuing in the same medium; the ray P_1 A after being bent in the direction, A *f* meets another bounding surface C D, the two surfaces A B and C D forming the lens, and is here refracted at C to the focus F.

All lenses are composed of glasses of one of

Fig. IV

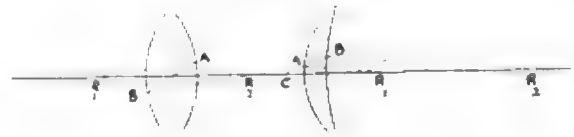


the shapes A, B, C, D, E, or F. A and D are respectively plano-convex and plano-concave lenses, B and E double convex and double concave respectfully, C and F convergent and divergent menisci.

Achromatic combinations or lenses constructed to combine visual intensity with the highest chemical intensity are combinations of lenses, one of the forms A, B, or C which are convergent, combined with one of the forms D, E, or F which are divergent, the combinations may be double, triple, or even a still larger number of lenses may be combined together. As a rule, and with the older glasses one general law obtained, viz., that the higher the refractive index of any kind of glass the greater was its dispersive power, that is to say, that if a prism was constructed of the same shape of any two kinds of glass, and a beam of light passed through such prisms, the beam would be bent or refracted more, and also the spreading of the spectrum would also be greater with the prism composed of the denser glass. The properties which obtain in some of the Jena glasses do not follow this regular order, for, in the cases to which we are referring, one glass may have a higher refractive index than another, and yet have at the same time less dispersive power; the contrary also holds in some cases, in that one glass may have a higher dispersive power than another and yet have a lower refractive index. The result of these improvements in glass manufacture has materially assisted opticians to overcome the difficulties formerly presented to them in the cure of astigmatism. Larger apertures are now possible than was formerly the case, consistent with a flat field and freedom from astigmatism.

The next matter upon which we must say a word is a property that all lenses possess. There is for every lens or lens system one point in the single lens or combination through which all rays of light will pass without deviation, this point is called the optical center In the two lenses shewn in Figure V, the method of deter-

Fig V



mining the position of the optical center is shewn. Parallel radii, R_1 A, R_2 B, are drawn from the centers of curvature R_1 R_2, meeting the surfaces of the lens at A and B. These are joined and in every form of lens the point where the line A B crosses the axis or is projected to meet the axis in C, is the optical center of the combination. From the Figure it will be seen that in a double convex lens this lies within the material of the lens, but in the convex meniscus it lies slightly beyond the deeper curve and outside the material.

In all lenses, except the tele-photographic combination to which we shall refer later on, the optical center may be said to be contained within the lens mount. We do not wish in this chapter to enter into what might be puzzling technicalities to the ordinary reader, so that we shall not enter here further into the question of the nodal or Gauss points and planes in optical combinations. There are in reality two nodal points in every lens or lens system, these two points are separated very slightly in some combinations, and very widely in others. This is particularly the case in a tele-photographic combination, and has an astounding difference in the back focus, but still maintaining the same equivalent focus according to whether the lens is screwed into the mount one way or the other, that is to say, whether the front or back combination is presented to the object. But, as we have already stated, ordinary positive systems have the optical center or the nodal point from which the focus is measured, self-contained. We do not propose to enter more fully into this interesting subject.

We may now proceed to the all-important "Law of Conjugate Foci," which is simple enough. The main principle to bear in mind in approaching this subject is the fact that image and object are always interchangeable. In Figure VI we see parallel rays from a very distant object passing through the lens and coming to focus at the point F 1; if we were to place a bright object in the position F_1, the rays would emerge from the lens again as a

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parallel beam. It is seldom in ordinary photographic practice that all the points in the subject are so far distant that they may be considered parallel, and hence it is that we must give the law of conjugate foci careful consideration. In looking at Figure VI it will be self-evident that if the parallel beam of light passed from left to right through the lens instead of from right to left, the image would be formed at F_2, the distance C F_1 or C F_2 being the measure of the equivalent focus, a factor which is known to the user of a photographic lens, as it is or should be accurately given by the optician. The law of conjugate foci is simply this, that

Fig VI



at whatever multiple of the equivalent focus the object is situated from the measure of the equivalent focus toward the object, the image will be displaced the reciprocal of the number of times of that number of times beyond the focus for parallel rays. In the figure we have shewn the object O situated at a distance of twice the equivalent focus, viz., O F_2 beyond F_2; it then follows that the distance F_1 I is one-half the focus beyond F_1. If the object was situated one hundred times the focus beyond F_2 the camera back would have to be extended one hundredth of the focus beyond the position at which it would be in accurate focus for parallel rays. The nearer the object approaches the lens the greater, therefore, is the displacement of the camera back from the position in which it is in focus for parallel rays. If the object O is made to approach the lens until the distance S F_2 is the exact measure of the equivalent focus, the displacement from F_1 must also be again the exact measure of the equivalent focus, and an object placed at S_1 will be reproduced of exactly the same size at S_2, these points are known as the "symmetric points." In the ordinary tables given for copying or enlarging, the common rule for copying the same size is to place both object and focusing screen at double the equivalent focus of the lens on either side of it, in other words, occupying the position of the "symmetric points." A generalization to be derived from the study is that if we are engaged upon photographing moving objects, if they are receding, we follow them with the focusing screen by wheeling in; on the other hand, if they are coming towards us, wheel out the camera and so again follow the movement of the object in order to obtain it in good focus.

Suppose the light from a star falls on a biconvex lens; these rays are assumed to be parallel. They emerge and meet at the principal focus as explained. Conversely, a candle placed at F would make the rays divergent (outgoing) parallel rays, so practically the star and the candle are theoretically interchangeable. These are conjugate foci, but in practice the rays from a luminous body are no longer parallel. If the radiating point taken is nearer than infinity (the star), but still situated on its axis, the rays emitted by the luminous body are no longer parallel; they diverge and fall divergently on the lens and their focus is formed so much the farther beyond the lens the nearer the point approaches it. At a point from the lens equal to twice its principal focal length, the image is formed at an equal distance behind the lens, and the nearer the radiating point gets, the further back the image is formed, and when the point approaches to the lens to the distance of the principal length, the rays emerge parallel to each other and no longer form an image.

External luminous objects may be considered to be made up of an infinity of luminous points, each of which sends a pencil of rays to our eyes, or to our focusing screens. It is thus clear why the image is upside down on the ground glass, for the light must travel in straight lines. From what has been said already, it will be seen that the sharpness of the image depends upon the relation of the size of a pin-hole to its distance from the plate, and that the larger the pin-hole beyond a certain limit, the less sharp the picture, but the brighter it is, the smaller, within certain limits, the hole, the sharper the picture but the fainter it is. Now the quickness or rapidity of the pin-hole or lens depends on the ratio of the working aperture to the equivalent focus. That is, supposing the hole or lens to be two inches in diameter, and the distance of the focusing screen eight inches from the aperture, the camera would be said to be working at 8 divided by 2 = four or $f/4$.

For convenience this is written as either $\frac{1}{4}$ or $f/4$ or spoken of as 1 to 4. To compare the relative rapidity of different lenses or ratio intensity as it is called, the denominators are simply squared, when the results will give the ratio of rapidity. Thus compare ratio intensities of two lenses working at f 10 and f 20 respectively.

(To be Continued.)

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A NEW FORM OF STUDIO.—Max Jaffé whose contributions to continental journals have done much to help photographers in many different ways, contributes to a recent issue of a Viennese contemporary, translated in *The Practical Photographer*, some notes on a particular form of studio, for which he claims many points of superiority over the ordinary glass house. Unfortunately, as the author himself points out, he is like the dramatist who has published in book form a play which is praised and censured by different critics, but which lacks the conclusive testimony of being put on the stage and performed. Herr Jaffé's ideal studio has not yet been built.

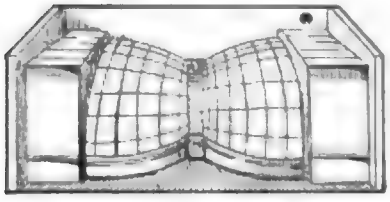


Fig. 1.



Fig. 2.

Fig. 1 gives a complete view of the studio as seen from the north side. Fig. 2 is the ground plan. The part *b c* which is shown in fig. 1 as a distinct section, instead of being glazed, should be composed of some strong material (such as metal), and so will serve for access to cleaning and repairing the glass roofs. As may be seen from fig. 1, the glazed part consists of two equal spherical sections. This spherical form is of great advantage in taking portraits, because the sitter will be almost exclusively lighted by perpendicular rays of light falling directly on him. In this way, not only will the exposure be shortened, but a greater clearness of the outline will be obtained. It would be possible in this studio to deal quite separately with those rays of light falling directly on to the sitter, and those which, which being reflected, serve to lighten the shadows. It will at once be clear to anyone who examines fig. 1, that each spherical segment would only allow the rays of light to enter that part of the room in its immediate vicinity. In this way the photographer can obtain any kind of lighting effects he may wish for. In no studio of other construction is it possible to attain this end in such perfection.

It is also urged that portraits of more striking likeness could be obtained, and that negatives would require a comparatively small amount of retouching. It may be said with reference to the latter point that it would not be necessary either in the high-lights or in the shadows to remedy the faults generally caused, on the one hand, by the insufficient detail in the high-lights, and, on the other, by the unsatisfactory effect of the rays in the shadows.

It has beeen said that the tunnel studio is superior to the one just described. Herr Jaffé asks for a consideration of the following points. The sitter is placed facing the tunnel and lighted by a corresponding opening in the spherical glazed part S (fig. 3). Is is acknowledged that this lighting can be at least as characteristic and clear as by Jaffé's system; but how does it act with the illumination of the shadows by means of reflected rays? Here the tunnel which absorbs all the light plays an important part, as that portion of the sitter which is opposite to it will appear very dark, and this inconvenience will not be greatly remedied by opening the curtains on the side SS. Any light entering on that side would be of little use for the part darkened by the tunnel; it would rather result in an uneven lighting (on the left, direct, sharp light; in the middle, darkness; on the right, scarcely lightened shadows). Yet, if these light-debarring curtains are kept shut, the result is a hard picture, harder than in the ordinary long house studio in which the illumination of the shadows is possible, though not in such a rational and reasonable way.

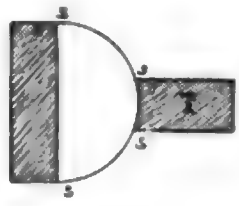


FIG. 3.

An artistic effect of lighting can seldom be obtained when the shadows are illuminated by means of direct light rays, because with these, even when diffused by ground glass or white curtains, it is never possible to get as soft and mild a lightening of the shadows as with those rays which are reflected from floor and walls.

The photographer, entering for the first time a studio built after this system, concludes Herr Jaffé, and well furnished with curtains, would be astonished at the abundance of reflected

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light at his disposal, with which direct lighting can in no way be compared, and which finally would have the further advantage of coming from a much shorter distance than in the ordinary long house studio, and would therefore be far more effective.

PHOTOGRAPHY BY THE RÖNTGEN RAYS, UP TO DATE. BY HALL-EDWARDS, L.R.C.P.*

(*Continued from Page 384, August.*)

The rays given out by the metal whilst only red hot, differ greatly from those given out when the metal has assumed a white heat. It appears to me that the difference in the character of the X-rays is simply due to some variation in the amount of vacuum, and it is highly important that some experiments should be made to ascertain the exact degree of vacuum at which the best results can be produced.*

The best tube I ever had was made for me by Mr. Cossor, but owing to its shape it was very short-lived—it only lasted a few hours. The first photograph I took with it was through the chest of a child 4 years of age, the exposure being 4 minutes; that period, however, was accidentally determined, for, after 4 minutes, the tube sparked over and touched the child's chest, causing her to start up, and upon developing I found the negative was a very good one, although if the accident had not occurred, I should have given more than twice the exposure that the plate actually received.

In the old form of tube the sparks entered close to the edge of the cathode pole, which always came opposite a sharp angle in the tube: it is opposite this angle that the "jets" form; it has occured to me that if the tubes were made egg shaped and the cathode pole taken well into the bulb the sparks would leap over without danger; the best way, however, is to make the tube of such a length that it is impossible for the spark to jump over.

In the new tube to which I have referred, there are several points in which I fail to see any advantage whatever. In the first place the anode pole is formed of an aluminium ring, and the platinum "reflector" is perfectly separate from it; I fail to see any advantage in the ring. The chief advantage of this tube is the substitution of thick loops for the small fragile ones hitherto used. It has often struck me that experiments have not been made in substituting other metals for the "reflector" in place of platinum. I find that the rays pierce a sheet of platinum more easily than they pierce a sheet of silver, and therefore I think it highly probable that silver might be better than platinum. I should also like to suggest that the metals tungsten and uranium, should be tried.

It has been frequently stated that the visible fluorescence of a tube is not a guide to its working power, but in my experience I must contradict this. I find that I can always tell how my tubes are working by noting the visible amount of fluorescence; and, moreover, the very best tubes that I have, fluoresce almost as well (if not so regularly), when the current is reversed, as when it is passing in the right direction; many tubes cease to fluoresce almost entirely as soon as the current is reversed, but a very good tube will fluoresce whichever way the current is going.

I at one time imagined that the intensity of the X-rays ran in direct ratio with the number of breaks made by the contact-breaker, and spent much time in devising an arrangement which would give me more rapid breaks. I now find that a certain but variable number yield the best results (at any rate from a photographic point of view). The number varies considerably with the state of the tube, and I find that best suited for my purpose by noting the amount of fluorescence.

I have made a series of experiments with the object of ascertaining the penetrability of various metals, but, owing to the extreme difficulty of obtaining the various metals in sheets of the same thickness, I have been seriously handicapped. Sheets have been chosen as nearly as possible of the same decimal gauge, and, although it has, so far, been impossible to obtain accurate measurements, they may be roughly placed in the following order

List of metals, placed in order of the resistance they offer to the passage of the X-rays: Aluminium, steel, zinc, tin, copper, nickel, brass, platinum, lead, and silver.

The brass in the list was composed of copper 63 per cent.; zinc, 37 per cent., with slight impurities, in all about ·03 per cent. The thickness of the sheets used was as near as possible 4 metal gauge, or ·012 decimal gauge.

The order in which the above list of metals is placed is only approximately correct, and it will

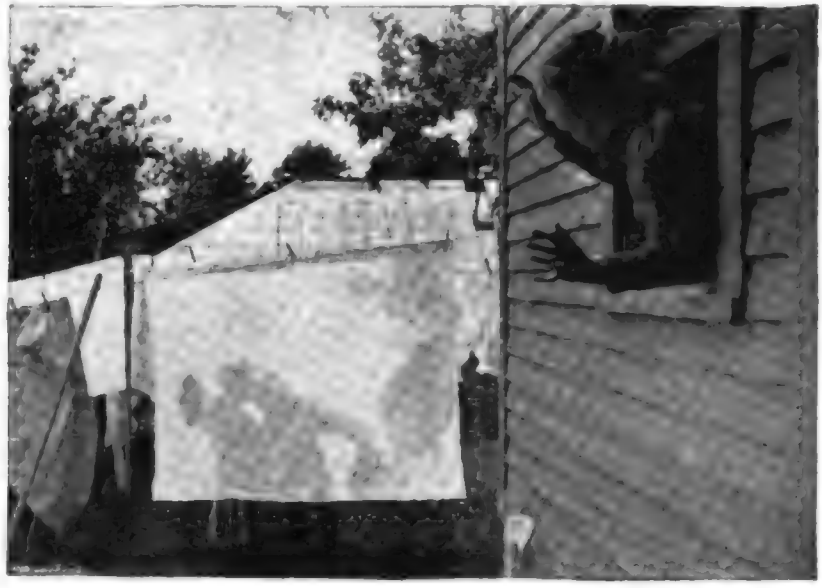
*Since writing the above I have noted that the character of the rays alters from time to time, even when the conditions appear unchanged. By this I am led to believe that the rapidity of the breaks in the coil has much to do with the varying effects produced.

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be necessary to make accurate measurements before an absolutely correct list can be drawn up; it is, nevertheless, sufficiently near the mark for all practical purposes.

During the progress of my experiments upon metals, I have noted an interesting point which I have not seen mentioned. It is a well-recognized fact that variations in thickness can be radiographed, and it is quite possible (using great care) to obtain a mixed image of the two sides of a coin. But this is not all; for, if a sheet of metal be dented, even so slightly as not to render one part thinner than another, this indentation can be pictured. If a radiograph be taken through the metal covering from the top of a bottle of pyrogallic acid, for instance, the lettering and trade mark will stand out as plainly as if it were photographed in the ordinary way, with a camera and lens. I at first thought that this phenomenon was due to the fact that, in the process of pressing up the image, the metal was considerably thinned in certain parts. I disproved this theory in the following way. A small piece of thin foil (a mixture of tin and lead) was pressed down upon a medal with the ball of the thumb, not sufficient force being exerted to stretch and thin the metal. I succeeded in radiographing the raised image with ease, and, on carrying out this method with care, I find I can obtain an image of any medal I may desire to copy. I then came to the conclusion that the production of the image was due to the varying distances of the surface of the pressed metal from the photographic plate. This theory I still hold, although it is just possible that the phenomenon may be due to an entirely different cause.

To try and ascertain the truth of the matter, I took two small pieces of sheet lead, about one-fortieth of an inch in thickness. These I lightly pressed upon a brass ring, so as to slightly raise a ring on each piece I now placed both pieces upon a covered plate. One I placed with the raised ring toward the plate, the other with the raised surface toward the tube. On examination of the negative I failed to find any differences between the two images, and had they not been marked, I could not have told one from the other, although in both instances the rings were perfectly distinct.



From Photograms of '96.
WHAT THE MISSUS SAW BY ORRIN C. DUNLAP

A brief consideration of the various theories put forward to account for the phenomena produced by the X-rays may prove of interest, and further may suggest a line of investigation to workers in this interesting branch of research. In the investigation of a subject of such absorbing interest (which is open to all who care to trouble themselves in the matter), it is only natural that much should be said (on the spur of the moment) which is found to be incorrect in the course of time.

All communications from untrained experimenters should be taken *cum grano salis*. It is a very simple matter to jump at conclusions,

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NEW YEAR'S MOON BY CARL WOLFF

but it quite another thing to substantiate and make self-evident the premises from which such conclusions were obtained.

Of the various theories put forward to account for the phenomena under discussion, not one is sufficiently well backed up by facts to give even the most slender grounds for its acceptance. Very many facts will yet have to be revealed before it will even be safe to jump at a conclusion without a risk of missing your footing.

We have at present at least three theories which are worthy of consideration, and to very briefly discuss the "pros" and "cons" of each (even in the light of our at present limited knowledge) may not be a waste of time.

The theories in question are:

The Electrical.

The Fluorescent.

Ultra-violet light.

In favor of the electrical theory we have the facts that, without electrical energy the phenomena cannot be produced, and that the intensity of the X-rays runs in direct ratio with the amount of electrical energy used, granting, of course, that the tube is constructed to carry the current. The experiments of Hertz have also proved that electrical waves can be transmitted to a distance and through solid bodies. On the other hand, we find that without a tube capable of producing the other phenomena which have been described by Crookes as being those of Radiant Matter, no photographic results can be obtained. We have, therefore, two factors which are absolutely necessary before the phenomena can be produced. Again, no matter what amount of electrical energy be passed through the tube, the vacuum of which has fallen below the point when the phenomena of Radiant Matter are exhibited, no photographic or fluorescent results can be produced. It appears to me that this fact alone is sufficient in itself to negative the electrical theory.

With the limited knowledge already at our disposal we consider that electrical energy is an absolute factor in the production of the phenomena, but if we are to judge from analogy there is every reason to believe that given a Crookes tube, there is no reason why some other form of energy should not be capable of producing similar results. It is a well-known fact that a ray of light falling upon a Crookes tube is capable of setting the molecules contained therein in motion, and that some of the phenomena of Radiant Matter can be observed under such conditions; the movement of the vanes in the radiometer when the instrument is placed in the light is an example of the effect of another form of energy upon Radiant Matter. Now it is not possible that X-rays may be produced by passing an intermittent ray of sun or other light through a Crookes tube. Anyhow we have not at present moved beyond all power of contradiction that electrical energy is an absolute necessity, therefore, to found a theory is, to say the least, premature.

In order to see whether a ray of light passed through a tube would produce the X-rays, I bored a hole in the shutter of my dark room, and allowed a ray of sunshine to pass through the tube for several hours, and also a ray of light to pass through for the remainder of the day. At the side of the tube, at the usual distance, I placed a plate enclosed in black paper with a metal disc upon the top, such disc being turned up edge-ways, so that no pressure should be exerted, but the result upon development was absolutely nil. It then occurred to me that perhaps an intermittent ray would produce some result, and I rigged up a clockwork arrangement, by means of which a disc with a hole in it was made to revolve in front of the hole in the shutter, but still there was no effect. At the same time, I have not entirely given the

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matter up, but have been so busy in other directions that I have not been able to continue my experiments.

That electrical energy without the aid of a Crookes tube, is incapable of producing the phenomena which can be produced by means of the X-rays, has been proved, hence to ascribe to electricity the production of the phenomena without further evidence is unscientific. The main factor is undoubtedly the presence of Radiant Matter, and it therefore follows that the phenomena is one of the properties of such matter when set into motion by suitable means.



From Photograms of '96
OSEA ISLAND BY J. JEFFERYS

Up to the discovery of Prof. Röntgen, Crookes tubes were looked upon as little better than interesting toys, but it must not be forgotten that it was predicted that the phenomena exhibited, is quite capable of being applied to useful purposes, and in all probability Röntgen's discovery, wonderful as it is, is only the first link in a chain which may prove of immense length.

Although it is impossible at present to say with certainty that the electrical theory is the wrong one, there is every probability that this may be the case.

The Fluorescent Theory.—It has long been established that the production of fluorescence is one of the properties of radiant matter when set in motion, and it was whilst investigating this phenomena that Prof. Röntgen discovered the action of the X-rays upon a photographic plate.

We have so far very little evidence that the change in the film is due to fluorescence entirely, for although we know that a dry plate can be acted upon by a fluorescent surface, there are many points which appear to disprove that this alone is the cause of the photographic action ; some of these I have already discussed, and although again it has been pointed out that photographic plates fluoresce when brought within the range of the X-rays (a phenomena I have not myself noted), I am inclined to look upon it as only of one the phenomena and not the direct cause of the effect.

The fact that negatives can be produced upon bromide paper is additional evidence that the fluorescence of the support does not make any material difference to the result.

Supposing that the result is due to the fluorescence of the silver bromide, or the gelatine, and knowing that radiographs can be produced a dozen or more at a time upon super-imposed sheets of bromide paper ; we should naturally expect that the silver would be deposited equally throughout the thickness of the film—this I have already proved not to be the case, and the fact somewhat discountenances the theory that the result is due to the fluorescence of the film itself.

On weighing equally the " pros" and " cons" of the case, the only just conclusion we can arrive at is that the fluorescence of the film, or its support, is but a secondary phenomenon, and not the direct cause of the effect.

The Phenomena due to Ultra-Violet Light.—In many respects the phenomena exhibited by X-rays simulate those produced by ultra-violet rays ; but they differ from them in many important respects, not the least being that substances which are most transparent to the X-rays are the most opaque to what has been called dark light. Take black paper as an example.

It hardly comes within the province of my paper to enter into a lengthy discussion upon these and various other theories which have been brought forward, and I have only briefly alluded to them with the object of showing

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SIEGFRIED. THE ATTACK BY WILL H. WALKER

that as a matter of fact we are perfectly ignorant of the causes of the phenomena.

That we have placed in our hands a new force, of great power, is certain, but we are quite unable at present to even guess at its ultimate usefulness, even to the photographer. Further, the discovery appears to have allowed us a peep over that shadowy borderland where matter and force merge into one.

That every effect must have its cause we all know, but should we be right in assuming that every cause must produce some effect? I think we should; for although in many instances the effects are so small, and the causes so subtle, our knowledge so incomplete, and we have no instruments to measure them—I think all the same that scientists will be ready to admit, that every cause must produce some effect. In the papers some time ago I saw that Mr. Edison was going to win a prize of some thousands of dollars for giving a gentleman back his sight by means of the X-rays. I do not believe Mr. Edison ever undertook to do anything of the kind; for as the X-rays seem to have no effect whatever upon the healthy optic nerve, I do not think it is very likely that they will have any effect upon a diseased one. Knowing the fact that the rays will pass through the head, it struck me that there might be some central organ which might be able to appreciate them. I had seen it stated in the papers that the optic nerve could do so, and I therefore tried some experiments upon myself—again with negative results. I sat, completely blindfolded, before a Crookes tube, whilst my assistant held close to different parts of my head various shaped pieces of thick lead. I could not, however, tell what was there, or even guess the shape of the object held between my head and the tube. I was a little disappointed, because I had hoped that in some extraordinary way I might have been able to tell which particular piece of metal was being placed in the path of the rays.

We have heard much about the effect of the X-rays upon the skin; this I think must be due to some idiosyncrasy of the operators, for although I have myself been experimenting daily for the past eleven months, I have failed to notice anything of the kind.

The advances which have been made in the application of the X-rays are, for the most part, purely medical. To the surgeon the improvements in tubes, and in technical details, have been a distinct advantage, and he is now able to take very much better photographs, and through thicker parts than was possible some time ago. I should like here to show a photograph which was very successful, and which is very interesting, inasmuch as the child (if he grows to be a man) will have to say that his life was given to him by means of the X-rays. It is radiograph through the chest of a child a year and nine months old. The child swallowed a sovereign (or was thought to have done so), and was taken to a medical man, who saw no symptoms that the sovereign was present. A month afterwards the child was brought to me, but I found no symptoms, and advised the parents to wait and see if any occurred; soon afterwards it had a slight attack of bronchitis, and there was distinct evidence of some pressure upon the trachea. By means of a fluorescent screen—a better one than I had when the child was first brought to me—I could distinctly see there was something in the chest, and, having persuaded an operating surgeon that such was the case, the patient was given chloroform and after an exposure of seven minutes this photograph was obtained. (Print shown, in which the image of a circular body was very clearly visible). Several similar photographs to this have been published in the medical papers, but in these cases the coins could all have

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been removed without the aid of the X-rays; in this case, when the child was under chloroform an instrument was passed into the œsophagus but failed to touch the sovereign, and the child had to undergo the very severe operation of œsophagotomy, and is now perfectly well. It is a record case from a surgical point of view, because it is the youngest child which has ever recovered from this severe operation.

One point that medical men desired should be cleared up by means of the X-rays is still as dark as ever. It was hoped that we should be able to photograph stone in the kidney, and the reasons for our not being able to do so are, to a great extent, photographic. The further away an object is from the plate, the more indistinct its image becomes; and it is curious, that, even when an object is placed a little distance from the plate the image cast (by a coin) seems to be fogged. (Negative shown to illustrate this point.) I ask any of you who are experimenting to see if some method cannot be devised by which this difficulty can be got over; if you find such a method you will make a very distinct advance, and will do a considerable amount of good for your fellow-creatures, because I am certain that stone in the kidney can be photographed if this one difficulty can be overcome.



From Photograms '97.

A SALTING. BY REV. A. H. BLAKE.

A NEW HAND-CAMERA, AND HOW TO MAKE IT. BY JOHN H. GEAR, F.R.P.S.

That the hand-camera has now made a position of some standing amongst the more pretentious photographers' all must admit, but it is not long since it was sceptically viewed by many whose aim was to produce photographic pictures of a vastly different nature, artistically and technically, to those of the general "snap-shot" type. The photographic tyro, and even others old enough to know better, at one time considerably lowered the dignity of anyone carrying a hand-camera; happily we do not now hear and see so much of the camera fiend, pure and simple, lurking about with the camera tucked away underneath his coat seeking to immortalize acquaintance or stranger, if caught in any ungraceful or undignified position. Then there is another section of hand-camera workers, harmful though they be, carrying the portable apparatus who chiefly aim at catching rapidly moving objects, and delight in avowing it to have been taken in some fractional part of a second, and so on. Yet another who carries an "instantaneous camera," as he terms it, and appears to apply the word "instantaneous" with evident satisfaction, and conveying the idea that under all conditions the apparatus is capable of representing anything and everything before the camera, if the magic button is once released. It seems almost incredible, but often the writer has heard of and seen exposures made with the shutter in leafy dells and interiors when prolonged exposures of minutes or hours were quite necessary.

He has nothing to say to the man who carries the camera "just for the fun of the thing" and for the gratification of depraved tastes, excepting the sooner he turns his attention to more suitable subjects the better for himself and photography. The less harmful "instantaneous" man is advised to seek the aid of a proficient photographer, consult current photographic literature, and join a photographic society, instead of endeavoring to develop that which has no latent image, and as a natural consequence developing nothing but disappointment and disgust.

To such photographically inclined persons one form of apparatus will be found about as good as another, but the writer is desirous of interesting those who look upon the hand-camera as an instrument capable of conveying

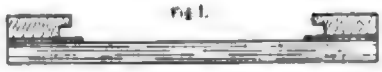
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artistic sentiment or obtaining a record of districts visited from a pleasurable or scientific point of view.

Many have the idea that it is not possible to compose a picture with a small camera nearly so successfully as with large apparatus. That is true to a certain extent, but the difficulty will diminish greatly as one gets accustomed to the small size. Others consider themselves heavily handicapped in working the small size and competing with their contemporary who uses a 12 x 10 or larger outfit. This again is more or less a fallacy. Possessing fully equipped kits of 12 x 10, 8¼ x 6½, and quarter-plate sizes, and having worked for years with each size, the writer may perhaps be able to form a fairly reliable opinion, more so than those who have the choice of one size only.

Certainly it is very nice to expose and develop your plate the size you require for con-

Fig 1.



tact printing; much time is thereby saved, but for all-round landscape, seascape, and river work the advantage in many cases is with the small apparatus. Who can trudge unaided over such ground as is most suitable for photographic picture-making, not usually of the easiest nature for walking, often miles from villages and civilization, with a kit weighing half a

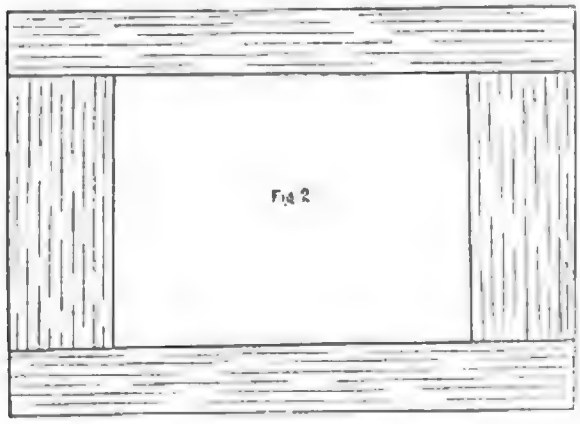


Fig 2

hundredweight or more? It may be suggested that prospecting beforehand and going direct to the place with the large apparatus overcomes this difficulty, but it is not always convenient to go two days, especially when it might be done in one; further many subjects are beautiful at one time by reason of the effects of light and shade at the particular moment. Those who have an eye and fancy for this character o landscape know, perhaps only too well, that these fine effects do not linger for days, often not of sufficient duration to enable one to get ready large apparatus. In many instances the writer has obtained pictures which otherwise would have been lost, had he not been able to make the exposure with less amount of preparation than is possible with say a 12 x 10 apparatus.

Having secured our subject upon the small negative it is simply a matter of technical skill to produce an enlarged negative of five or six times linear or even more, without the question being raised whether it is an enlarged negative or not. The writer is not aware of being characterized as a hand-camera worker as some exhibitors often are, probably by reason of his pictures being of a larger dimension than others who use and exhibit quarter-plate size; nevertheless 50 per cent. of the writer's 12 x 10 exhibits are negatives made from the hand-camera quarter-plate negative or a portion therefrom.

For all this, however, the writer would never recommend anyone to start with a hand-

Fig 3.



camera, it being one of the very worst commencements a beginner can make; it is calculated to produce a careless and slovenly method. First start with an ordinary stand camera, fully grasp the photographic possibilities and impossibilities, the latter being greatly increased by the use of an ordinary hand-camera; then will the tyro be less likely to throw up photography in disgust, as many have done before.

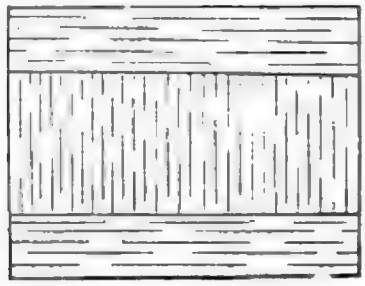
The number of hand-cameras of one kind and another are too numerous to give even the most brief sketch. All have advantages and disadvantages, the latter probably predominating. However, some are undoubtedly very useful pieces of apparatus, masterpieces of cabinet-making; some simple, others veritable boxes of tricks, enough to puzzle even the most astute; there is, therefore, no occasion to marvel at a tyro or even a more accomplished worker given up the choice of a hand-camera in utter despair.

The writer, having a fancy for making his own apparatus when found by experience what was required, turned his attention to the mak-

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ing of a hand-camera. The following is just a brief outline of the instrument, which has never failed through a couple of years' constant use, winter and summer. A finder giving the same size image and focusing with the camera, rapid interchangeability of lens (Taylor, Taylor, and Hobson's patent standard flanges perform this desideratum in the most simple and efficient manner), the capability of using lenses of

Fig 4.



varying foci from 4½ inches to 6½ inches equivalent focus, a focal-plane shutter for rapid and cap for time exposures, and light double dark-slides upon the "cut-off" principle.

Such a camera has proved of the greatest service for seascape, landscape, and genre work, has never occasioned a moment's trouble, though subjected to some rough usage when engaged upon marine work. Whilst this particular camera has proved most suitable for the purposes mentioned, it utterly fails if architectural work is to have consideration. Many

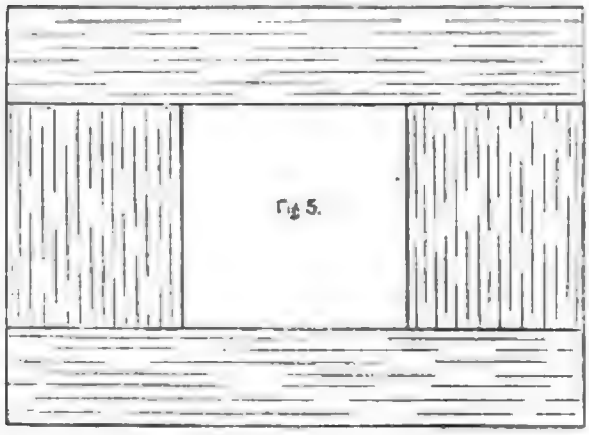


Fig 5.

times the writer has required greater latitude, viz., a shorter focus lens, swing-back and rising front in this camera during the exposure of a large plate for several hours in the cathedrals, etc.

Further, there is another section of the photographic persuasion which claims attention, *i.e.*, the cycling fraternity, and the camera just referred to is not quite the requisite piece of apparatus for carrying upon the cycle, by reason of its size, though the dimensions are as small as is possible with that type of camera, nevertheless the up-to-date cyclist is more or less of "scorching" propensities, and anything he is to encumber his machine with must be absolutely of the smallest and lightest make. having taken into consideration then what is required and likely to be accepted by the cyclist, at the same time fulfilling the requirements of the average photographer, the writer has, at the repeated requests of the Editor, put his ideas into a practical form and constructed such a camera as must recommend itself to the amateur photographer in whatever branch he may wish to follow.

A principal feature of it is that whilst the camera can be kept ready for immediate use as an ordinary hand-camera it can be utilized as a stand camera, having a rising front, swing-back, and capability of using lenses of 2½ inches equivalent focus up to 6½ inches, without loss of time. The outside dimensions are 8 inches by 6½ inches by 4¾ inches; weight, including lens, shutter, and one dark-slide, 2½ lbs. When not in use six dark-slides will go inside the camera.

Before going minutely into details of construction, the simplicity of which alone must commend it to those capable of using the cabinet-makers' tools, there is the all-important question of lens or lenses demanding attention.

It is obvious to everyone that whatever may be the quality of the camera it must necessarily fail if it has a poor or unsuitable lens; however, it may not be an absolute failure if it has not one of the modern anastigmatic lenses, there being not the slightest reason why it should not be the means of producing the most beautiful pictures in capable hands, even if fitted with a common spectacle lens costing as many pence as the anastigmatic pounds, but such a lens would necessarily be very limited in its capabilities, as likewise lenses costing higher prices, according to the grade of the lens. If the cost of the lens does not seriously affect its selection, then have the best, and your work will not fail on account of the incompatibility of your lens, provided the photographic impossibility is not attempted, as is too often the case.

The most suitable lens for the hand-camera is one giving flatness of field, crisp marginal

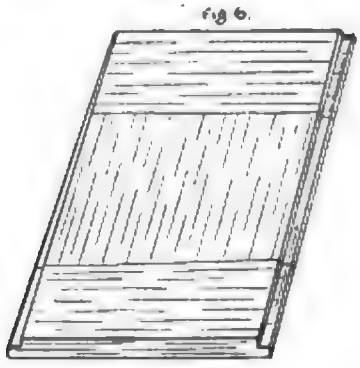
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definition at a moderate angle with a large aperture. These qualities are to be found in the anastigmatic type of lens; for instance, the Goerz, Zeiss, or Cooke.

The number of lenses and foci must be determind by the character of work undertaken. The writer has been using for the past two years 5 inches and 6 inches Cooke lenses, which were selected by reason of their fine definition and *f*/6·5 aperture.

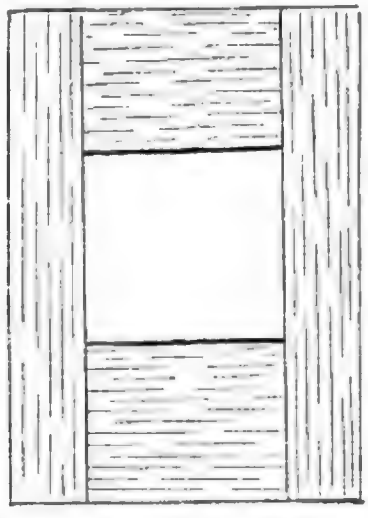
If one only is determined upon, an equiv.

Fig 6.



focus of 4¼ inches or 5 inches will be found most serviceable. With 5 inches and 6 inches Cooke and a 2·35 equiv. focus Cooke, specially made, but which will soon be commercially obtainable, the writer is fully equipped for all work expected of a small camera. All the

Fig 7



lenses, having Taylor, Taylor, and Hobson's patent flange, are quickly changeable.

The question of carrying plates for hand-cameras is also of importance. The magazine finds favor, and under special circumstances where changing plates daily cannot be accomplished it has something to recommend it. Under ordinary conditions, the double dark-slide has much to commend it, and the writer strongly advises its use in preference to magazines of any description. He has found six double slides as many as necessary under normal circumstances. Should twelve plates be too few, take twelve slides, and the results will repay the little extra bulk. The book-form slide is objectionable by reason of its weight and thickness. The writer has used the No 3 folding kodet slide of the Eastman Company for years with entire satisfaction; it is a double slide, thin and light, of the "cut off" principle. If due care is taken in inserting and withdrawing the slide, no trouble of fogging plates will ensue.

The shutter most suitable for this camera is the Thornton-Pickard snap shot or T. and I. shutter with speed indicator fastened upon the rising front; it is behind the lens, the flange, therefore, being upon the shutter does not interfere with the free use of different lenses.

The writer has no pretentions whatever of being a practical cabinet-maker, but will endeavor in his own crude method to make as clear as possible the construction of the instrument in the small amount of space at his disposal, and hopes to succeed in elucidating the difficulties of those who have not the opportunity of studying cameras and their appurtenances *ad libitum*.

Well seasoned and sound mahogany should be chosen, and planed to barely ¼ inch in thickness. This will be of sufficient strength, as it is the intention it should be covered in leather.

Square up a piece of mahogany 7⅞ x 4¾ inches accurately, to form the bottom; upon each of the longest sides glue a strip ¾ inches wide and $\frac{1}{16}$ thick; upon this glue rabbeted strips ¾ inch wide and ¼ inch in thickness as in Fig. 1.

In the center of this place a bush for taking the tripod screw. Next take two pieces and square to 7⅞ inches by 6¾ inches to form the sides; in the center of one place another bush as in bottom piece, for use when camera is upon its side; the grain of the wood should run the shortest way. Now square up another piece 4¾ inches by 4¾ inches, the grain with the latter measurement; this forms the top. The remaining 2¾ inches, making the length of the camera, is taken up by the door upon the top for inserting the dark slide. Screw the two pieces 7⅞ inches by 6¾ (but do not do not glue, it having

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to be taken apart again) to the edges of Fig. 1. Glue and screw the top piece 4⅞ x 4⅝ at the top of the side pieces, bringing it flush with the front; this forms the box or body of camera without front and back, with the space left at top for door.

Frame up a piece for the back as Fig. 2, outside size fully 6¾ x 4¾, leaving an opening of 4¼ x 3¼ inches. These joints must be tongued to give sufficient strength. An easy method of tonguing is to put a saw cut into each piece,

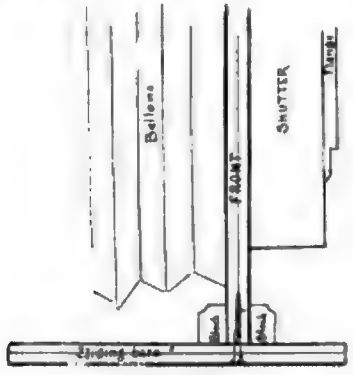


FIG. 8.

forming the joint about ⅛ deep, into which insert a piece of veneering wood, the grain across the joint as in Fig. 3. When nicely fitted the whole is glued and clamped up till dry.

Le Page's fish glue will give much stronger joints than common or poorly made ordinary

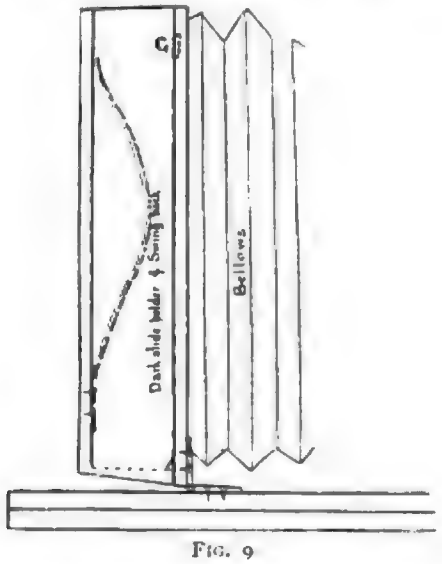


FIG. 9

glue, and has the advantage of always being ready for use.

The framed piece just made forms the back of the camera, is put on over all, but glued and screwed at both sides only. The opening, 4¼ x 3¼ inches, is for the door, which is to be hinged, and will open for the purpose of arranging and focusing objects when used upon the tripod.

Fig. 4 is the door, size 4¼ x 3¼ inches, thereby allowing ⅛ inch all round for leather covering to be turned in.

This must be clamped and tongued, the grain running in directions shown in illustration.

Another piece must be clamped and tongued the same as Fig. 4, size 4¼ x 2¾ inches, to form the door at top for shutting in dark slide; the measurement given again allows ⅛ inch for turning over the leather covering.

The next consideration is the front, and Fig. 5 will fully explain its construction. The outside size is 6¾ x 4¾ inches, which allows a trifle for trimming in order to fit the front of camera more accurately. The square opening in center is 2⅜ inches; a door must be clamped and tongued to fit this, it should, however, be ⅛ small all round to allow for turnings.

When these several doors are hinged the outside body of camera is complete. The small door in front is for ordinary hand-camera work, it being intended that the whole front should be opened for prolonged exposures, and when a wide-angle lens is in use.

The sliding base and front for carrying the lens have next to be made. The base is 4 x 3⅛ inches, and should be fully ¼ inch thick, clamped, the longest sides rabbeted as shown in Fig. 6.

This base must be fitted to move smoothly in the bottom of the camera, Fig. 1. The front, to which the bellows will ultimately be fastened, need be only ⅛ inch in thickness. Its outside dimensions are 5¾ inches by 4⅛ inches, with an opening as shown in Fig. 7, 2⅜ inches by 2¼ inches.

Two rabbeted strips ¼ inch wide must be glued and screwed upon this front at each of the longest edges into which the rising front will slide; it is obvious the front and rabbeted strips should be the same thickness. The front should be 4¾ inches by 4¼ inch, with a round cut in the center 2¼ inches in diameter; it should, of course, fit well in the rabbeted strips, and not too loosely; as it is not intended to have any spring or fixing screw for rising front, it is not necessary that it should be clamped, the shutter being screwed on makes it sufficiently strong and will prevent it twisting.

The front is now ready for fixing to the sliding base, Fig. 6. Great care must be exercised

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in fitting front to ensure it being square; if this is not done, the front will not be a true plane with the plate, and the good qualities of any lens will be seriously impaired when in use with a large aperture. The front surface should be exactly 1⅛ inch from the edge of the base, as shown in Fig. 8; it should be glued, and two or three screws put through from underneath the base.

Set it *accurately* at right angles with base, afterwards strengthen it with a couple of square strips or blocks running right across back and front.

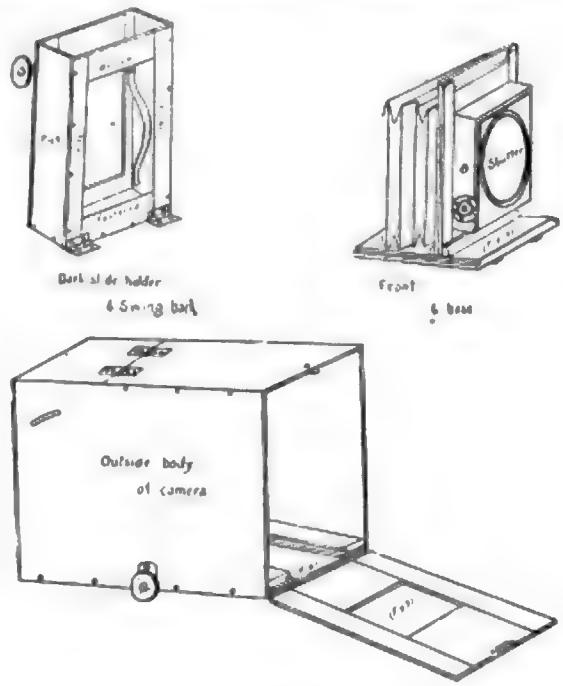
To complete the woodwork there is but one part more to make, viz., the swing-back, which carries the dark slide and also to which the bellows is fastened. Wood $\frac{3}{16}$ inch will be of sufficient substance. Two frames are made, outside size 5⅛ inches by $4\frac{3}{16}$ inches (this should just fit the inside of the camera and move smoothly); the opening of these frames must be 4¼ inches by 3¼ inches (size of plate), and are to be connected on both sides and the bottom by pieces 1⅛ in width, thus giving fully one-inch space for insertion of dark slide from top, and pressed forward into register by means of two springs fastened to inside of the back frame and shown by dotted lines in Fig. 9. A groove ¼ inch wide and $\frac{1}{16}$ inch deep must be cut across top part of front frame, and should be done before they are connected, to admit the small projecting piece upon the dark slide, thereby preventing the light from entering between dark slide and frame, and fogging the plate when the shutter of slide is withdrawn in camera. Dotted mark G in Fig. 9 will explain position.

The frame upon which the front of dark slides is pressed should be lined with black velvet to ensure a light tight connection.

Two hinges are screwed to the bottom of the slide-holder and fastened to the base, but before this is done bevel the slide-holder (as shown in Fig. 9) at the bottom to allow of plate being swung backwards to bring vertical lines parallel when camera is tilted downwards, or to bring foreground of landscape into focus with a large aperture.

The bottom of camera must be cut across in order take the pinion; cut a piece out ¼ inch in width to allow the center of pinion to be exactly 3¾ inches from the front edge of the bottom board of camera, the milled screw for focusing coming outside on the right of camera when in use. A pair of racks to engage this pinion must be placed underneath the sliding base (Fig. 6); these should be slightly sunk, must be fixed parallel, and admit of the focusing operation being carried out firmly but smoothly.

The shutter may now be screwed to the front, the flange for lens having been previously screwed to the shutter. The whole of interior wood-work should have a coat of dead-black varnish. The Thornton-Pickard Manufacturing Co. will supply black shutters if requested. The several hinges and fastenings for the openings should be put on and the whole put together. It is advisable to place a spring on



the small front door so that it will fly open as soon as unfastened A scale for focusing can be attached to the top of front, and viewed through a small hole cut in top of camera. But with a 4 inch or 5 inch lens a scale is hardly necessary, and in order to arrive at the equivalent focus without looking upon the focusing screen, a small spring catch can be attached to the front carrying the lens at the equivalent focus, and a stop upon the runner which holds the front and sliding base in position; this is a simple matter and will answer the purpose effectually.

A milled-head screw should be brought through the right side of camera, attached to the swing-back by a small brass rod, and a slot cut in the side of camera to allow the movement of swing-back and it being clamped in a perpendicular position.

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Fittings for a view-finder can be placed upon top and side of camera outside, there not being sufficient room to allow of finders on the inside; the best of the small finders is undoubtedly Adams' triple lens, Brilliant, with reversing top for horizontal or vertical pictures; they also make a cheaper kind called the "Daza," which is very good, but does not include quite so wide an angle, the angle of view being about the same as a six-inch focus lens upon a quarter-plate.

A handle should be placed on the same side as focusing pinion for carrying. A small hole can be cut in a corner of the front to allow of the pneumatic releasing tube to brought out.

A few minor details have no doubt been over-looked, but the writer feels he has sufficiently explained the general construction, and that anything not enumerated will be suggested by the ingenuity of those attempting it as they proceed.—*The Amateur Photographer* (English).

WARM TONES ON PLATINOTYPE PAPER.* BY S. L. COULTHURST.

The obtention of warm tones has always been possible with the ordinary black platinotype paper, yet it does not appear to be as widely known as it deserves.

Some may say, why use the black paper when there is a special paper made for the purpose we have in view?

The answer to this is plain. It is well known that the sepia platinotype papers are not at all good in their keeping qualities. The paper at times somewhat varies in its color, and it is not so easy to work as the ordinary or black papers; moreover, it requires greater care in printing, it being more easily affected by faint light, and the developing solution must be heated to a temperature of 150 to 160 deg. Fahr., to obtain the greatest amount of brilliance. This being so, it will be readily seen that if we can get equal results by using the ordinary black paper we save much time and trouble.

To simplify matters we will take one make of paper, say that known in the photographic world as C C., which is a rough-surfaced paper, thick and strong, and specially made for cold-bath development. We will assume that you are already fully conversant with the method of producing ordinary platinotype prints.

To be able to produce black or warm tones at will upon one make of paper is no doubt an advantage; even the most enthusiastic admirer of the grays or blacks of a fine platinotype print sighs at times for a warmer color for some of his pictures.

There are several methods by which we can obtain these warm tones, and I will endeavor to give you a few hints on their production.

For the present we will leave out the after-obtention of warm tones, and deal only with those obtained by direct cold development.

In all cases in which we are now considering, the prints are printed under the negative in the usual manner as for black tones.

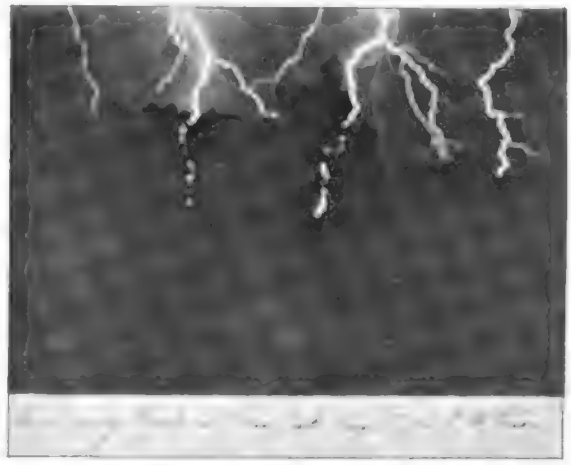
The first method is one which, I think, is of German origin.

To the ordinary developer, be it the ordinary oxalate bath of about 2 ounces of oxalate to 20 of water, or the special developer recommended by the Platinotype Company, is added 1 dr. of a ten per cent. solution of mercuric chloride, and which must be well mixed into the developer. The print is developed with this solution, which will give a brownish-black tone, which, after slightly clearing in the acid bath and washing, is placed into a bath of

Ferricyanide of potassium	10 grains
Nitrate of uranium	60 grains
Acetic acid	1 dram
Water, to make up	10 ounces

In this bath the prints will slowly turn a rich sepia, getting redder the longer they are left in the bath.

It is doubtless due to the mercuric chloride in the first bath that we get an equal deposit



* Demonstration given before the Manchester Amateur Photographic Society.

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SNAP SHOT BY DEXTER THURBER, JR

all over the print. When the desired color is reached they should be slightly washed in weak acid water, and finally washed in the usual manner. This method is to my mind rather a slow one, and takes away one of the chief charms of platinotype printing.

The second method to which I would draw your attention is perhaps the most simple, and at the same time is one which can be recommended as speedy and efficient.

In this method all that is required is the addition of 3 or 4 dr. of a ten per cent. solution of mercuric chloride to the ordinary developer. The more mercury added, the warmer the color, but beware and do not load your bath with too heavy a dose.

Care should be taken not to over-develop, the prints drying considerably darker than they appear when wet.

The prints obtained by this method are very fine, and the bath is capable of much variation.

There is one point in the production of warm-toned platinotypes by these methods which should be carefully noted. In the fixing or acid bath they will change color more or less, losing somewhat their brown or sepia tint. The change is sometimes only slight, and would be unnoticeable in any other printing process, but in platinotypes we look for no change whatever. It is recommended to pass the prints through two weak acid baths in rapid succession and well wash.

I would impress upon you that in all cases where mercuric chloride is used, the bath must be fresh for each batch of prints. It must not be used after three or four hours' mixing, the best results being obtained by a perfectly fresh bath.

Quite recently, Mr. A. P. Smith draws attention to a new method of obtaining sepia tones, and which he says, although it contains mercury, is photographically permanent, having given prints a test of twelve months' exposure to sunlight. The tones obtained are very similar to those obtained by the other methods I have named, yet it will be seen that it is not so simple in its use. It can, however, be used for various shades of chocolate and red chalk by certain modifications of developer. The formula used by Mr. Smith is as follows:

A = Potassium oxalate	4 ounces
Water	16 ounces
B = Copper chloride	124 grains
Water	8 ounces
C = Mercuric chloride	1 ounce
Water	16 ounces
D = Lead acetate	32 grains
Water	4 ounces

For use, take 6 ounces A and 2 ounces B, mix well, then add 2 ounces C and ½ ounce D. These must be well shaken together, so as to mix them perfectly. Now apply heat until the precipitate is dissolved, and development can then be made either with the developer hot or wait until it is cool. The best results are obtained with the hot developer.



From Photograms of '98.

STUDY OF A HEAD BY AGNES F. JENNINGS

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This method, to my way of thinking, does not give such good results as is obtained by the other methods I have given you.

It is said that sepia or brown tones on platinotype paper are not so permanent as the black, be they produced on the special sepia papers or by the means I have described. The warmth of tone in both papers is undoubtedly due to the presence of mercury, in the special sepia papers, it being added to the sensitizing solution.

It must be understood that these methods of obtaining warm tones on the cold-bath paper, which is intended for black prints, are not recommended by the Platinotype Company, and for any failure to obtain satisfactory prints they must not be held responsible.

These are the outcome of study and research by various workers, and having tried them in a greater or lesser degree, I give you the results of such trials.



BREAK OF DAY BY F. HURNDALL

THE HAND-CAMERA.

SPEAKING at a recent meeting of the North Staffordshire Photographic Society, Mr. S. L. Coulthurst said the hand-camera has given the enthusiastic photographer a new interest, and invested his life with a new and inexhaustible charm. To many it is a delusion and a snare, because too much is attempted with it; but there is hope that with study and practice the awakening will come that makes the little camera an inseparable companion.

The influence of the hand-camera is sometimes termed demoralizing, in that it often tempts to luxury and the leaving at home of the larger and heavier camera, but on the other hand its portability ensures its being taken out with the photographer under all circumstances, and this is a most important gain. Experience teaches us that for artistic photographic pictures, and especially those suitable for the hand-camera, it is most important to be always ready with the camera at the right moment.

Success with a hand-camera depends in a large measure upon the spirit and seriousness with which the work and selection is undertaken and followed up. If the little handy camera is carried because it is portable and you are lazy, and is regarded with a certain amount of carelessness, on account of its small size and ease in working, it is demoralizing. But if it is operated with enthusiasm and with the idea and determination of following the work to the end with care and patience, the result may be as admirable as that by the largest and most costly apparatus.

What beautiful effects can be secured of light and shade in sea and river scapes, wind-blown reeds and rippling waters, and the delightful clouds perfectly rendered! That the hand-camera can be the means of artistic expression there is no doubt. Pictures can even be built up with foregrounds and skies in the some way as in the older form of camera.



"THE GHOST" BY J. DE BRUYN KOPS

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The hand-camera is in daily use, and thousands of plates are exposed; yet do the results justify this? I think not. This comes from the fact that sufficient thought and care is not exercised in the work on hand. These failures are often traced to the use of the hand-camera without studying its uses and powers. Some workers shoot off at anything and everything on the off chance of getting a few good shots in between—by accident. It does not appear to trouble them what the light or its direction, giving exposures they would never dream of giving with their stand camera with shutter attached, and, above all, not paying sufficient attention to the proper composition of the picture.

The man to succeed is one who has studied photography from its serious standpoint. He has been taught that a picture must be conceived and then composed in his ordinary camera, and that it is the same in the hand-camera, but in a more prompt manner. He also knows it is useless to set his shutter too fast or too slow, and to get a negative of a certain kind he must use a stop suitable to the subject. It is useless exposing a plate unless everything is in correct order—light, lens, and plate, all working in harmony.

Pictures can be obtained in all sorts and conditions of weather. It is here where a great amount of judgment is required. It depends upon what we wish to portray. If purely topographical or matter-of-fact subjects are required, then perhaps we shall work with a good clear light or even sunlight; but if pure picture-making be the aim, then we choose our lighting as we choose our picture, be it sun, cloud, rain, or fog.

Whatever is attempted, good technical work is to be commended. Yet technically good negatives must not be considered artistic because they are technically good—artistic merit is something more.

I hope I may be of some little use to the intelligent worker, for I think the enjoyment and benefits derived from pressing the button and hiring some one else to do the rest are of brief duration. It is attended with much expense, and the only satisfaction that is gained is scolding the one who develops when the negatives do not turn out right.



SUNSET ON THE CARRIBEAN SEA BY GOMEZ CARRARA

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EVENING. BY JOHN A. HODGES

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EDITORIAL NOTES

Below is a sketch of the bust of Daguerre recently erected at Bry sur Marne, the village where he spent the last days of his life. The sketch is taken from *La Vie Scientifique*.



BUST OF DAGUERRE ERECTED AT BRY SUR MARNE.

From all parts of the world we have received photographs and articles for our 1898 Annual and we are able to promise our readers that the next volume will be far ahead of its predecessors. Some idea of the amount of work involved in the get-up of this publication will be obtained when we state that we have already placed orders for *over a quarter of a million* pictures to be inserted in the book. These include several colored pictures by new processes, photogravures, albertypes, etc. We think there will be a big rush for this Annual as soon as it is out, so it would not be a bad idea if you gave your dealer an order for a copy now. We have offers of several dollars for some of the other issues by disappointed persons who failed to order a copy in advance.

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Mr. W. N. Jennings, of Philadelphia, a valued contributor to this magazine, is now in England. At a recent meeting of the Royal Photographic Society, he said that in the year 1880 he commenced a series of experiments in the photography of lightning flashes, principally with the object of demonstrating the inaccuracy of the zigzag delineation of lightning, commonly seen in paintings. His first successful photograph of a flash was taken in September, 1882, and he thought this ante-dated other photographs of the kind. Mr. Jennings showed a number of lantern slides from his negatives, and pointed out the peculiarities of different varieties of lightning flashes. He also exhibited slides showing the North Dakota Indians' conception of lightning, and pointed out that it was more nearly accurate than the conventional zigzag flash. In the course of his remarks he said that throughout his experience, extending over 17 years, he had never seen a zigzag flash, and the cracks formed by heating glass frequently followed very closely the outline of lightning flashes. He also exhibited a photograph showing a collision between two flashes; and a rare discharge known as beaded lightning, probably a molten mass of matter rotating during its flight. This might be a "thunderbolt." In several of the photo-

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graphs there appeared to be a dark dividing line running through the length of the main stem of the lightning, which was attributed to over-exposure and reversal of the most brilliant part of the flash. The dark flashes appearing in some cases as branching off from a bright stem were due, he thought, in one case at least, to violet flashes which he had himself seen proceeding from an extraordinary flash of lightning. From a stereoscopic photograph of a wavy "branched' discharge it was evident that the undulating appearance of one portion arose from the spiral nature of the lightning. "Ribbon" flashes were, in his opinion, caused by the widening of the conducting path; during one storm he noticed that the first crack in the ether was immediately followed by a whole series of flashes in the same path, and there being a high wind at the time, the conducting path was broadened out and produced the appearance of ribbon lightning. To test this point he photographed an electric discharge, obtaining a sharp result, and then took a second photograph at a time when some one was blowing across the path of the spark, the negative image being in this case broadened out in exactly the same manner as ribbon lightning.

* * * * *

We have received from General Passenger Agent, D. J. Flanders, of the Boston and Maine Railroad, an unusually fine print (8 x 10) from a negative by official photographer Henry C. Peabody of that enterprising railroad, made from Kilburn Crags, Littleton, N. H. The picture is a bird's eye view of Littleton village, and the beautiful Ammonoosuc Valley, showing Bethlehem, the popular summer resort of the White Mountains, in the distance six or seven miles away, and what is still more remarkable, the snow-capped peaks of the Presidential Range, over twenty miles distant, perfectly distinct. There is a beautiful harmony prevading the entire picture, both in the distance and in the foreground, and the sky is well preserved Altogether it is the best bird's eye view that we have ever seen.

* * * * *

In a book on Platinotype printing* recently published in England, Mr. Packham's describes his method of toning these images.* He says:

The prints to be operated upon may be those produced by either of the known processes, as the hot-bath black, the hot-bath sepia, and the cold-bath black. The printing-out papers by Pizzighelli and by Hardcastle also show a great affinity for the coloring matters employed, but in every case, so far as present experiments have gone, although they show a greedy absorption of the tinctoral matter, the resulting tones are of a very warm character, and these last named papers are not nearly so susceptible of control as the ordinary platinum papers.

In preparing prints for this after-process of toning, every precaution must be taken in protecting the paper from the action of light, other than that passing through the negative. Wherever the slightest deposition of platinum takes place there will be a coloration, more or less intense. By these precautionary measures the high lights are kept brilliant.

When using the cold-bath black platinotype paper there is a decided advantage in allowing it to be acted upon by the atmosphere prior to development, either before or after printing, preferably before. It may be stored in a dark drawer or cupboard for one or two or even several days, which will give the prints an additional power of absorbing the tinctoral matter; but if kept thus for too long a time, especially in a damp atmosphere, the whites are inclined to become degraded.

Development has a decided effect in governing the after-color of all kinds of platinum prints, when treated by this process. Old baths of potassium oxalate that have been used several times, or a mixture consisting of some old and a portion of a newly made bath give the prints an increased affinity for the coloring matter. Baths slightly—*i. e.*, very slightly—acidulated with oxalic acid give colder tones than an absolutely neutral developing bath, and baths that are slightly alkaline give much warmer tints.

The admixture of certain organic substances, as, for instance, glucose, sugar, and honey, added to the developer, have the power of increasing the affinity of the platinum deposit for the tincture.

A favorite developer of Mr. B. Gay Wilkinson gives excellent results where absolute brown tones are required; it consists of seven ounces of potassium oxalate, three-quarters of an ounce of genuine West India sugar dissolved by boiling in fourteen fluid ounces of water for a few mintes; on this develop either cold-bath or hot-bath paper by flotation at 100° or 120° Fahrenheit.

* *Platinotype Printing* (8s., Hazell, Watson, and Viney, Ltd., London), in which book it appears as a supplemental chapter.

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Prints that have been developed by the glycerine method are not suitable for toning by this method, and solarized over-printed portions of deep shadows are with difficulty made to absorb the color.

It is necessary that all possible traces of iron, and clearing acid, be thoroughly washed out, but it is not necessary that the prints should be dried; although better results are obtained, where complete coloration is desired, by allowing the prints to be kept for some time before toning.

To prepare the toning bath, take a packet of Packham's prepared compound, "Tinctoral Powder," and dissolve by boiling for three or four minutes in five fluid ounces of water (this is best done in a Florence flask, over a spirit lamp or Bunsen burner). When cold add one ounce of methylated spirit. In this form, if well corked, it will keep for a long time. This is the stock solution. To make a bath up for use, take one pint of water and raise it to a temperature of from 130° to 150° Fahrenheit. Add to this about 30 or 40 minims of the above stock solution; immerse the print or prints in this bath, keeping them well covered, and the temperature up to this point, until the desired tint is secured. This method is called the warm-bath method. The toning will be complete in a few minutes.

For the cold-bath method of toning, the process is much simpler—the same proportions of stock solution and cold water are taken. In this dilute bath steep the prints, turning them over from time to time until the depth of color desired is arrived at.

The cold-bath method may take several hours where great depth of tone is required, but it is by no means troublesome. For a single print, or for only a few, the hot bath is more rapid; but great care is required, at the higher temperature, to avoid degrading the whites, and in hot water the paper, after the acid clearing bath, is very easily torn; therefore where large numbers of prints have to be manipulated, the cold-bath process, although taking a somewhat longer time, is quicker in the end, and therefore recommended. The water being cold, the prints can be handled without fear, any reasonable number can be done at one time, but unless there be plenty of the liquor in the dish it will soon become exhausted, and the prints also require more frequent turning over to avoid unequal toning.

Do not allow the bath to become darkened. If it does, throw it away and make a fresh one, either in the hot or cold process, or the whites will probably be stained; but a slight creaming of the whites sometimes is desirable, and materially adds to the harmony of the effect.

During both the hot and cold process, the bath will gradually become of a reddish dark color, probably by the formation of rubinic acid, especially if the water contains much lime. This may to some extent be obviated by using one or two grains of neutral Castile soap, or the same quantity of oxalate of potassium to the pint of water, but each will give a somewhat warmer tone to the prints.

In working the hot bath, it is advantageous to have a tray of perforated zinc, not quite touching the bottom of a deep developing dish, containing the toning solution. This dish may again be placed upon a sand or water bath, in order to maintain the temperature.

When the prints are toned to the desired depth, they are removed from the bath, and rinsed in two or three changes of cold water, and then dried in the usual way.

The finished print when dry is greatly improved by a good rubbing with a dry, soft cloth.

There is again a further operation which is most useful where absolutely clear whites are required. You dissolve forty grains of Castile soap and eighty grains of bicarbonate of soda in each pint of water at 180° Fahr., and maintaining this temperature and allowing the prints to steep in this for five or ten minutes, the whites will be cleared up, and the colors be intensified.

The tint may be much improved by passing them through a bichromate of potass bath, of a strength equal to a dark straw color, or they may be modified by a very dilute bath of any iron solution which gives a grayish, warm green tint, but after each of these operations they must be well washed. They may be passed through the bichromate bath before they are passed through the soap bath, but after the iron bath they must be only well washed; a dilute acid bath will remove a considerable portion of the color if they are too dark, which may be restored by again passing them through the soap bath. The materials of which the toning bath is made may be had from Miss Packham Katharine Street, Croydon, England.

THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA HELD A VERY SUCCESSFUL CONVENTION.

AT CELERON-ON-CHAUTAUQUA, CHAUTAUQUA CO., N. Y., ON JULY 12TH TO THE 17TH.

The Convention was called to order by President C. M. Hayes with these remarks:

Ladies and Gentlemen, we were so happily and cordially welcomed last year by a gentleman representing the business interests of Jamestown that it is thought it would be a pleasure to you to hear again from the Hon. Porter Sheldon. (Applause.)

ADDRESS OF WELCOME BY HON. PORTER SHELDON, JAMESTOWN, N. Y.

"MR. PRESIDENT, LADIES AND GENTLEMEN: It gave me great pleasure last year when I was asked by our people to speak words of welcome to the P. A. of A. upon the occasion of their first visit to our city, and to the classic shores of old Chautauqua. You were then a stranger within our gates, and very few of us had any just appreciation of the association, or of its great principles and achievements in the field of art, in fact most of us were imbued with the popular fallacy that in photography there was no true art, that it was all along the same plan with the nickel-in-the-slot and you-touch-the-button-and-we-will-do-the-rest machines. Happily for us, we courteously gave our people the opportunity of viewing and studying the masterpieces of art which thronged the wall of your exhibition; it suddenly dawned on them that the cultured ladies and gentlemen of the P. A. of A. were not nickel-in-the-slot or you-push the-button automatons, but that they were pastmasters in a great art.

Happily for us we received that education from your exhibitions here last year, and I have, on behalf of our people, to thank you most enthusiastically for the services you rendered us in that behalf, and it occasions me enhanced pleasure this morning to address you, not as strangers but as valued friends, and to bid you a thousand welcomes again to our vicinage, and to wish you the utmost success and pleasure in this your attendance upon our second meeting here: Mr. President,

President C. M. HAYES of Detroit then responded as follows:

There is something to me in the combination of letters that make up the name Jamestown, and in the human concomitants of its citizens all that needs to be written to spell out the word enterprise, broad guage business methods and spontaneous courtesy. There is, too, something about the combination of name and people a seductiveness of influence as potent as the attraction of the magnet for the needle, and once anyone has been subjected to the influence you throw around your guests there is no breaking away from it, a sweet slavery that one does not want to destroy or give up. It has had such an effect on the craftsmen of the photographic art that we can see but one place in all this broad country to locate our home, and that with you. In my official capacity I have felt more strongly the potency of the charm and been bewildered by a growing admiration that I thought had reached its climax when I first met so many of you.

Take away, if you could, the grand and glorious lake on whose shores we now, for a second time, hold our convention, and you do not remove the most potent charm. It is, to be sure, the great diamond in the center of the setting; but its environments are nearly as rich, as there seems to be no other place where such a beautiful sheet of water could as appropriately have been located. It is not the scenery, not the delicious breezes, nor yet the location, that holds us entranced, but you yourselves.

Your courtesy, your rare faculty of making us feel as if at home among our friends, that conspicuous but not obtrusive hospitality that makes the spot so dear to us all. Your men of business throw away, it seems, their cares and have but one object, the happiness of their guests, and devote themselves to this pursuit in a manner that far surpasses mere convention hospitalities, and to them and you is the Photographers' Association of America ever under lasting and tender obligations, obligations more difficult to discharge than a farm mortgage at fifteen per cent. on a rocky farm, in a hard year, with crops at a discount; but of a pleasing and endearing nature.

I could not help notice, while driving around your beautiful city last winter, the air of industry and the hum of enterprise, and in that hum, what a contrast with the major part of our country. For where your wheels turned, others were silent, and the turning of the wheels of trade means as much to the photographer as to the mill or factory owner. I thought how happy indeed were those who had the pleasure to live always with you, for in every wreath of smoke that went upward until it reached some fleecy cloud, I saw a message of happiness to some worker's family, a growing business prosperity, and, with it, happiness and plenty. Where other chimneys of the country were as smokeless as the untrod ice-fields of Greenland, yours were sending upwards their letters of content and peace.

It was a delight that I shall not forget, and it made me feel that Jamestown, minus its lake and its beauties of scenery was still the one place where thrift and prosperity made their homes, and showered down their attendant blessings.

Jamestown, without Lake Chautauqua, is grand and good but with it, simply excels all others so far that the race seems like a procession, and there is none other than Jamestown.

July 14, 1897.

PRESIDENT HAYES'S ADDRESS.

LADIES AND GENTLEMEN: Almost from time immemorial it has been the custom of men gathered together for mutual improvement and benefit to counsel together out of their experiences, and from them draw lessons that may give profit to all.

Like the sailor (who for days had been stormed-tossed on the unblazed path of the ocean, without sun to guide his course by day or stars to give him reckoning by night, he seeks the first opportunity to read the fixed guides of the heavens and learn from them his location, and fix his course for the future, we cannot do better than imitate him, and by consulting the fixed status of our profession or business if you will, learn our latitude at the present time.

It is alike the privilege and duty of the presiding officer, at a time like this, to make a tracing, however rude it may be, of the lessons of the past, and from

them, draw conclusions for the future. It has been the privilege of my predecessors in office to point out the marvelous strides towards prosperity, and the individual march of certain ones to phenomenal success. I would that I could do so now, but, alas! such is not in my power, yet with the low ebb of the trade photographic at present, we may still draw some lessons. A wise man has summed up in brief the fact that economy is the enemy of prosperity, but another equally wise, has told us that inflation is the nemesis of financial success, and in the ebb-tide that follows comes the reaction of the flood-tide of the other.

Any data based on fiction must, sooner or later, bring a conclusion as false as the promise, and I would be remiss in my duty, did I not, in this brief summing up, hold fast to truth undeniable, however unpleasant it may be. We must concede that, while there have been some isolated cases of unusual business prosperity among our draftsmen, during the twelve months that have rolled by, yet prosperity has not been so great that we have been forced to get out sunshades and fans to keep us from being overcome by its fierce rays.

It is but melancholy satisfaction at best to know that we have all suffered alike in this regard, and yet there is satisfaction to be gathered from the fact that while we have been with the rest of the world in our business depression, yet we have not gone backward, not only that, but we have gone steadily forward in our art as I think the most skeptical will be convinced in the most cursory view of the exhibition in the Annex. What the merest passing glance at that exhibit will show, is but accentuated and more than doubled by a closer and broader view, as I think you will all agree.

Rising above the mere sordid view of our position, I would call your attention to the thought that we are showing progress as a direct result of these conventions. The miser view of the world is to get what you can and keep what you get, but what a narrow view is this. In such a view there would never be a convention, never a place for the Photographers' Association of America, and I would not be here now. We are bound together under that better motto of give what you get and by that same giving get more; for in the free exchange of ideas comes the acquirement of knowledge as well as the giving of it.

It is not given to any one mind to comprehend the full details of any one thing, but in many minds and the free interchange of expressions comes the myriad minded expression that reaches the highest apex that we can get in any line.

Let us then take a brief retrospective view of what we have done the past year, and I am glad to say that there have been no radical changes, no startling departures. I am glad of this from the fact that it proves to me that we are getting close to the exact science of our art. It is in new and untried fields that startling departures are found; in the undiscovered avenues of trade that radical departures are made, but not in the well-developed and thoroughly explored trades.

We have made haste slowly, but in that very increase which is as certain as day, we have shown that steady progression that every one recognizes in the art display.

It is much more pleasant to commend than to criticise and much more productive of good feeling, but it is by criticism that we improve. The fault of to-day when clearly seen but shows the way and is the pointing finger for the path for improvement to-morrow.

The general proposition is that this Association can be successful only as long as it has sufficient members to make it strong, and it can only hold those members as long as it shows, to each, a reason for the retention of membership, with the attendant expense.

The cost of operating such an organization is great, and we must keep the standard of profit to members at such a plane as will make the majority, in fact all, anxious to keep their membership, by adding new features.

To do this is no light task, for with all the antiquity of adage that there is nothing new under the sun, there is no truth more modern that is more true, and it will require, as it does now, the greatest effort on the part of the five chief executive officers to find new expressions of the old thought to interest our members. For the idea that it is our duty to our art to keep alive such an association I have but the most open contempt. The word duty, to the ordinary mind, brings the thought of something unpleasant, and unpleasant things are the last one desires to consider. No, my friends, it is the merest clap-trap to talk of duty bringing us together on these annual meetings and, as soon as we have lost sight of the individual benefit to be derived from such convention, we lay the foundation for flaw that will wreck this Association, or any other. This is a very practical and very material world in which we live to-day, and, however much we may regret the fact, it is nevertheless true that, as soon as you show a lack of benefit from a membership, you provide a very satisfactory reason for a relinquishment of such membership, and that means a more or less speedy dissolution.

It is all well to talk about keeping out the manufacturers and the exaltation of the artist side of the question, but no association of the scope of ours can be held together without the support of a financial nature, that we obtain from the manufacturers; and utilitarianism is as necessary to our success as members of this association as real art. We cannot hope to hold their support beyond the time we can show them that it is of real benefit for them to join issues with us.

The manufacturer will continue to contribute only so long as he can see the benefit of so doing, and, while many may talk broadly of devotion, it is my experience that the question will drift down to a question of dollars and cents, the real rock bottom of all financial transactions.

There were two questions decided at our last annual meeting to which I would invite your consideration at this time.

The first was the appointment of State Secretaries, and the other, the printing of a verbatim report of our meetings.

I would be heartily in favor of the first, if we were on a basis to undertake the expense, and, I believe, all will agree with me that such a move is useless, unless we can in some measure provide that each secretary be furnished with the proper materials of his office: the providing of office expenses in the way of postage and stationery. You will need no pencils to figure out the result of trying to do it when we have but $1,100 in the treasury, from which we must pay the expenses of our annual meetings. What would be left for the State Secretaries is only represented by a minus sign.

As far as the stenographic reports of our meetings are concerned, I would be most heartily in favor of them, if such a plan was within the scope of our financial abilities.

There is necessarily much of a dry and uninteresting nature in any annual meeting, and while every man is prone to delight in seeing his remarks in the official proceedings, I ask if it is wise to incur this expense. Our excellent trade journals are quick to perceive that which is of general interest to us all in these meetings and are extensive in their reports, so much so, that I deem it wise to recommend that the full reports be omitted, until such time as the Association can better stand the expense.

The competitive features of our exhibits seem to me of the greatest good. Each member sees the progress of the others, and in that view derives new ideas which enable him to better cope with his competitors. New poses, new lighting, new methods, new accessories, and new generalities spur him on to new departures, and in very stimulation he is benefited, and from a financial standpoint derives profit.

I have watched with keen interest each year's improvement in our exhibits and have taken much satisfaction therefrom in the National Association, but could could you have watched with me the vast improvement shown in the Michigan exhibits each year you would have been as surprised and charmed as I have been.

Starting with a first exhibit which could not by the greatest stretch of the imagination be called creditable, I have seen that grow until our last meeting when the display was the most meritorious kind, and I am free to state that I doubt if ever a better state exhibit was shown. I think that in this statement, brother Bellsmith and brother Todd will fully bear me out.

In this connection I want to advise a little more freedom in expression, for I fear there is two much reserve, too much holding back through modesty. There is none so exalted that cannot derive benefit from the most retiring. Be free in expression, open in advice, and whatever idea you may have to advance, do so with the full knowledge that you are conferring benefit on your fellow members. Remember that, as James Russell Lowell says, "the same thought though oft expressed is his at last who says it best," and in your very expression of some old idea you may give it a new meaning, and not only benefit others but yourself as well, for no man can confer a benefit on others without the reflected sunshine of such benefit brightening his own life. There is nothing more true than this, and in your explorations you may open a field of discovery that like bread on the waters will return to you a hundred fold.

On the question of a permanent home for the Association, I would recommend that we make haste slowly, and not act until the most mature deliberation shall show the best way.

On the question of giving medals for superiority in work, I have very decided ideas. It is a question in my mind if the richest medal that could be wrought of purest gold, studded with the purest diamonds from the fields of Brazil would convey more of merit than a simple ribbon with the insignia of "First Prize" to the minds of the ordinary customer. It is not this intrinsic worth of the insignia as much as the simple fact that draws the attention of the waiting world.

The amalgamation of the State and National Societies also demands serious consideration, and it is well to think deeply before we decide on this. The question of expense and benefit should be carefully considered, and I must admit that I have as yet not been able to reach a convincing stage in this matter.

There are so many things to be considered and carefully weighed that I would rather trust to the majority of interest than insist on any opinion that I might advance under the hurried consideration I have been able to give the subject.

A general proposition to which I would invite your attention is that it is better to cling to the things which we know have proved efficacious rather than fly to untried plans that may mean failure.

The following is a list of the prize winners:

The Grand Genre Prize, a handsome silver punch bowl and ladle to the Baker Art Gallery of Columbus, O.

Grand Portrait Prize to J. Ed. Rosch of St. Louis, Mo.

Division prizes, gold, silver, and bronze medals:

EASTERN DIVISION.

Genre.	W. R. Otto, Buffalo.
Class A.—1.	Dudley Hoyt, Rochester.
" 2.	A. N. Camp, Jamestown.
" 3.	J. G. Nussbaum, Buffalo.
" 4.	H. S. Schervee, Worcester, Mass.
Class B.—1.	J. B. Schriever, Emporium, Pa.
" 2.	C. E Smith, Greenville, Pa.
" 3.	C. L. Rosevear, Toronto, Can.
Class D.—	F. S. Jansen. Buffalo, N. Y. Silver Medal.
"	Bronze medals to all exhibitors having a certain percentage of merit.
"	Remington, Buffalo.
"	J. Newman, N. Y. City.
"	Lee Stearns, Wilkesbarre, Pa.
"	Cairns, Newark, N. J.
"	W. Ashman, Baltimore
"	W. W. Cowles, Seneca Falls, N. Y.
"	Van B. Wheaton, Schenectady, N. Y.
"	Chas. E. Craven. Kane, Pa.
"	Tilton & Spuhler, Haverhill, Mass.
"	Rogers & Newing, Binghamton, N. Y.
"	Chapelle Studio, Oil City, Pa.
"	E. E. Seavy, Newcastle, Pa.
"	Jno. Betz, Jr., Baltimore.
"	J. H. Hopkins, St. Thomas, Ont.
"	E. Talbot, Schenectady, N. Y.
"	F. W. Stiles, Westerly, R. I.
"	J. F. Jackson, Barrie, Ont.
Class E.—1.	L. V. Kupper, Edinboro, Pa.
" 2.	Tilton & Spuhler, Haverhill, Mass.
Class F.—1.	Charles L. Rosevear, Toronto.
" 2.	J. E. Stanton, Sing Sing, N. Y.
Class G.—1.	Jno. Betz, Baltimore.
" 2.	C. L. Rosevear, Toronto.
" 3.	A. N. Camp, Jamestown.
Class H.—1.	Jno. Rosch, White Plains, N. Y.
" 2.	Geo. E. Tingley, Mystic, Conn.
Class I.—1.	J B. Schriever, Emporium, Pa.

MIDDLE DIVISION.

Genre.	Bakers Art Gallery, Columbus, O.
Class A.—1.	F. L. Stein, Milwaukee, Miss.
" 2.	B. A. Brigden, Chicago.

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Class A.—3. W. J. Root, Chicago.
" 4. M. W. Minns, Akron, O.
Class B.—1. Thos. Harrison, Chicago.
" 2. F. R. Barrows, Ft. Wayne.
" 3. H. J. Sperry, Aurora, Ill.
Class C.—1. Klein, Milwaukee.
" 2. Geo. Smith, Cincinnati.
Class D.— Wm. Godfrey, Chicago. (Silver.)
" Gilbert Temple, Clinton, Ia. (Bronze.)
" O. H. Parke, Clarinda, Ia. (Bronze.)
" Nicholas & Son, Greenville, Ind.
" C. B. Hines, Valparaiso, Ind.
" J. H. Hendrickson, Cleveland.
" W. T. Smith, Saginaw.
" Teubers, Chicago. (Bronze).
" The Loomis Photo Co., Galesburg.
" C. J. Van Deventer, Harlinville, Ill.
" W. O. Huszogh, Chicago.
" Reuschler, Ann Arbor, Mich.
" Parke Willis, Crawfordsville.
" Clifford & Son, Muscotine, Ill.
" Hughes, Joliet, Ill.
" Reeve, Monmouth, Ill.
" Schreiber Bros., West Bend, Ind.
" Ben Larrimer, Marion, Ind.
Class E.— Allen Fanjoy, St. Louis.
Class G.— McPearson Bros., Rockford, Ill.

SOUTHERN DIVISION.

Genre. G. Moses & Son, New Orleans.
Class A.—1. F. M. Somers, Memphis.
" 2. McCrary & Branson, Knoxville, Tenn.
" G. Moses & Son, New Orleans.
" 4. Knafil Bros., Knoxville.
Class B.—1. Homeier & Clark, Richmond.
" 2. Thuss Bros., Nashville, Tenn.
J. P. Howie, Columbus, S. C.
Class C.—1. McCrary & Branson, Knoxville.
" 2. N. H. Hoffman, Savannah, Ga.

WESTERN DIVISION.

Genre. F. W. Guerin, St. Louis.
Class A.—1. J. Ed. Rosch, St. Louis.
" 2. Geo. Steckel, Los Angeles, Cal.
" 3. F. W. Guerin, St. Louis.
" 4. F. G. Schumacher, Los Angeles, Cal.
Class B.—1. H. A. Bellsmith, Denver.
" 2. Rose & Co., Denver.
" 3. P. Sweifel, Duluth.
Class C.—1. Geo. Steckel, Los Angeles.
" 2. E. Peck, Red Wing, Minn.
Class D.—1. P. H. Bower, Leavenworth, Kas. (Silver.)
" 2. Bushong & Feldon, El Paso. (Bronze.)
" 3. S. Anne, Portland, Ore. (Bronze.)
Class G.—1. E. E. Peck, Red Wing, Minn.

Many interesting papers were read, reports of which will appear in our next issue.

METHODS OF CONTROL, AND THEIR INFLUENCE ON THE DEVELOPMENT OF ARTISTIC PHOTOGRAPHY.*

BY A. HORSLEY HINTON.

Unless I am mistaken, papers professedly dealing with what is, rightly or wrongly, termed the *art* side of photography have not hitherto very prominently figured in the Convention programme, and when I found myself honored by an invitation to prepare and read a paper for the present occasion, I regarded it as yet one more recognition in high places of the growing popularity with which this particular side of photography is regarded.

I do not think anyone who has an opportunity of seeing the description of work produced by all sorts of workers, young and old, professional and amateur, in towns or in the country, can fail to note that, whatever the result obtained, with the greater number of those who practice photography *the intention and aim* at least is to produce a *picture* rather than to demonstrate the characteristics of the process. Such a conclusion too is borne out by the fact that at every important exhibition the character of the works sent in necessitates by far the greater proportion of space being allotted to the perhaps not too accurately styled "art section."

This might be taken as sufficient reason for a paper being read at so important a gathering as the Convention on this eminently popular pictorial aspect of photography, but that I was led to believe (though this again may be a misapprehension) that those who attend this great annual congress are chiefly those who are mainly concerned in the physical and experimental phase, and those who by their researches or their manufactures supply the material wherewithal, and the knowledge, essential for the production of the photograph of whatsoever initial motive.

Then yet another possible delusion of mine is that Convention papers are by no means chiefly meant for the edification of conventioners. I have been myself to the Photographic Convention before this year, but I frankly confess I never found my way to a paper reading in time, and singularly few of my fellows were able to tell me anything about the papers afterwards until they appeared in print, so I concluded that these papers are supposed to be annual contributions to the general fund of photographic knowledge and thought drawn from certain well-disposed and easily beguiled persons by a philanthropic secretary, to the end that being gratuitously offered to the press they may be distributed amongst thousands of readers throughout the world, and prevent their saying that we meet only for frivolous enjoyment.

This idea being present with me should, whether erroneous or not, secure for me your indulgence, if what I have to say seem to appeal more to the general average of photographers than to the distinguished company in whose hearing it is read—a company which includes those who by enjoying at the present moment the sea breezes on the marine parade show their keen power of discriminating between good and bad, or at least between a greater and lesser good—a company largely composed of those but for whose splendid services in the fields of science and mechanics neither I nor any who practice photography with the same end in view would ever have been able to use photography at all.

Now, if I were only required to state my case to those present here, their knowledge of contemporary photographic art (I use the term in a loose and general sense) would render it unnecessary for me to say more than this, namely, that I, in common with some others, have

* Read before the British Photographic Convention.

for long maintained that the man employing photographic means for the production of a picture is free to take whatsoever liberties he choose with the performance of his tools and materials, and indeed is justified in calling in any auxiliary means if by so doing he can better fulfil his intention; and inasmuch as the chief means employed is photography (and no well-conditioned alternative term has been suggested), we may not hastily refuse him the use of the term photograph to describe his works, always and of course provided that he does not dishonestly produce them as examples of pure photographic process. But bearing in mind a possible larger number of hearers or readers, I want to show reason for suggesting that some auxiliary means for picture production has always been sought for, and that such auxiliaries merely constitute the exercise of control over the formation of the photographic image: that only when such control is exercised is photography anything but the most mechanical of crafts; that the more freely such control is used and auxiliary means introduced the more possible does it seem that in photography, at present so questionable as an art, we may one day have a perfected means of artistic expression especially adapted to the requirements of its time. *But* —and here I might especially appeal to those here present (and others outside whom we shall meet with anon), those who are concerned in teaching and educating others and on whom devolves the office of conferring awards and distinctions, and thus encouraging any particular work—those on whom such responsibility falls need to be placed on their guard lest in encouraging unduly the pretty and pleasing work in which photography has been largely assisted or controlled, liberty gives place to license and in control uncontrolled those very qualities in photography which may be usefully employed are gradually lost sight of, and good photography die in our midst, too cold and neglected to engender a new life from its ashes.

I would seek to secure the admission that personal control to the extent of employing auxiliary means is essential if photography is to become a means of pictorial or artistic expression, and so I would find a justification for such practices, then I would utter a caution lest after recognizing the inefficiency of photography we allow it to degenerate, and I would try to point to the weak places where enervation and degeneration may creep in and rob of its individuality and distinctiveness as a possible artistic method of which as yet we are only witnessing the dawn.

This matter touches very vitally, if indirectly, the interests of everyone connected with photography in whatsoever capacity.

The slowness and difficulty of manipulation of the wet collodion plate was as much a hindrance to the pictorial worker as to any other, and the chemist came to our help. The incorrect rendering of color values of the unorthochromatized plate was a defect, an inefficiency which the landscape picture-maker resented as greatly as did he who copied colored models. But that uncorrected plate was the pure and perfect photography of its day, and in introducing colored screens and plates specially prepared to make those screens more efficacious we did but seek to exercise a measure of control towards a given end.

Many such instances having reference to the modification of apparatus as well as of materials must in the time at my disposal necessarily be omitted in the progressive chain of links forged by the combined requirements of the picture-maker and the skill or knowledge of the scientist, until we come to consider the use of the pencil as an assistance in modifying the negative image. It was the *abuse* of retouching which brought it into discredit and led the Photographic Society to constitute it a disqualification at its exhibitions, an illogical act of itself if the mere pictorial effect of the work was its *raison d'etre*, but, as results have shown, a very laudable one in the end, for whilst it may have restrained the unbridled use of the retouching pencil in incompetent hands it may also have made the user more careful not to let the pencil overstep the duties of an auxiliary and a subordinate, in short made him careful not to be found out in its use!

Now, I do not think it were straining the argument too far to say that but for the weaknesses or imperfections in the photographic process markings, due to bubbles in the developer, "pinholes," excessive hardness and transparency in the negative shadows, and so-forth, would never occur. To put it more safely, were the process still further simplified and improved it would not be possible for us to let such defects occur, but as the process does permit of the possibility of making these mistakes, subsequent auxiliaries, such as opaque spotting, matt varnish, and other tricks become essential and are, therefore, justifiable.

As another example bringing me nearer to my principal point I would instance intensification and reduction by means of chemical solutions, and especially local intensification and local reduction. Whether we locally intensify or reduce in order to make the final result more like nature, or in order to produce the effect our fancy dictates, we must I think, speak of the performance as exercising deliberate control over the unaided photographic result.

Again, is not the use of retouching, as we call it, a tacit recognition either of photography's natural inefficiency or else of the particular operator's inability to obtain what he wants by purely photographic means? Now, please notice that from the particular standpoint which, on the present occasion and for the sake of my present argument, I have taken, the admission of alien methods is equally justified whether we agree that it is the natural imperfection of the process as we at present know it, or the absence of skill in the operator, because the conception and realization of a picture is an entirely personal matter, and whether the pure photographic rendering is or is not the best untouched, is a matter for the individual producer to decide for himself. Because one man can accomplish a certain thing purely by recognized photographic means, it is not incumbent upon another to accomplish his end by similar means, nor even is he to be reckoned less successful or less able if he achieve the same certain thing by less purely photographic means. I must claim this individual liberty for all pictorial workers, otherwise the realization of each man's artistic aim becomes but *an exhibition of comparative skill* in using certain prescribed instruments and media. It is but a very proper instance of an end justifying the means.

Remember, please, that I am speaking of pictures, or what are intended as pictures, not examples of photog-

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raphy or of any other process. If, for the sake of example, two men set themselves the task of rendering a certain poetic phase of nature, so as to suggest to the spectator some of the feeling which the original conditions suggested, or, in other words, if two men set themselves the task of rendering a certain phase of nature artistically, and both elect to avail themselves of whatever advantages they deem photography to be possessed of, it matters not at what stage in the work each exerts some special control over the photographic procedure, or when he introduces some alien means, or how much of such means he calls into his service. The result obtained by each is, as a picture, judged quite apart from the means of its production, and if the artistic abilities of these two workers are compared (a very wrong and foolish thing to do) they are compared and judged by the result achieved, their productions are not regarded as exhibitions of skill in wielding a certain machine.

This is somewhat of a digression from my principal theme.

Now, I have instanced certain common practices for modifying the simple mechanical photographic image, and have suggested that they are methods of alteration or control which few photographers would hesitate to justify, and the same might be said of such "dodges" and "tricks" as using mineral paper on the back of the negative, or printing in one portion and covering over another, and finally "sunning down" the finished print.

It may be argued that with "spotting," "retouching," and intensification and reduction we have merely methods for correcting technical defects due to our own clumsiness or neglect; and even if this be granted, I think, whilst I do not propose to put this more fully before you, you may reflect for yourselves that the passage from such methods, the purpose of which is to remove a defect, to methods which have for their purpose the introduction of something, is one so natural that it were difficult to draw a line anywhere and say this is legitimate but that is not.

It has been said that those methods are legitimate which destroy or leave out, such as retouching, masking out skies, etc., whilst those methods are not permissible which introduce some new feature. I should, however, like to point out that if we admit "sunning down," to take only one instance, the *destruction* of a glaring high light is equally the *construction* of a shadow or a lower tone. To keep a shadow from printing deeply by covering a portion with paper we destroy an over-deep shadow, but at the same time we are creating a lighter tone which was not in our negative, and possibly was not even in nature.

There are those that hold—I have held and taught the same myself from insufficient thought—that we may suppress, but not add anything which our negative gives, but, as it now seems to me, that as regards the methods to which I have already made reference, the act which suppresses simultaneously introduces. Is retouching destructive or constructive, does it *destroy* a line or a shadow, or does it *construct* a lighter tone in an under-exposed or badly illuminated shadow. In like manner if printing-in is constructive, making a darker portion, to that part which awhile you cover up to let the other gain strength, it is relatively destructive. Do we "sun" a print down to introduce shade or to destroy a high light?

I will not continue longer in this strain, as I desire these remarks of mine to be suggestive rather than an attempt at a conclusive argument.

I would only ask if we have any right to condemn this or that attempt at a pictorial realization of an idea or of some phase of nature (to do which the distinctive qualities of the photograph have been employed as far those qualities will yield to the will, or as far as the particular operator is able to apply them)—I would ask, are we to condemn the result which is otherwise satisfactory, because we find the photographer has sacrificed some of the cherished attributes of the process, or because we happen to know, or from expert scientific knowledge discover, he has called in the aid of some foreign means or appliance when pure photography failed him?

I say with intention, and I repeat, "happen to know, or from expert knowledge discover," because the illegitimacy of an alien method is proclaimed, and the limitation of methods of control is reached WHEN THE MEANS BY WHICH ANY EFFECT IS OBTAINED IS SELF-EVIDENT. So soon as, whether by painting, or pencilling, or masking, or any other contrivance, error in form, falsity of tone, variation in texture, or any other violation of what the educated eye looks for as a true interpretation of Nature becomes visible, then we may justly condemn the manner of its doing, but the principle which admitted it is not affected. Again, when from want of knowledge, lack of judgment, or sheer carelessness, it is, without expert scientific knowledge, apparent that brush or pencil or other means has been employed, and incongruity of the whole is visible, then the auxiliary has become the chief, and the governing.

I would emphasize this because it answers the objection to retouching when it is unintelligently used, and destroys true tonality and correct drawing. By the same it condemns painting on the print to any but a very limited extent, if indeed it needs to be used at all, because the hand work is detected, and thus the whole is not homogeneous, the means employed are self-proclaimed; also with combination printing, and even with such a simple thing as sunning down; it is bad when badly done; it is badly done when it is self-evident.

I know the photographic expert who will speak in terms of admiration of a photographically obtained picture, but tell him it is not just exactly what its negative would yield in the hands of another, and his estimation falls at once. He admired it as an example of photography. Now I have nothing to say against such an one, if he will but let me admire it as a picture.

If a man sees a volume by Thackeray, and looks forward to a pleasant time for reading, only to discover that some scientific treatise has been bound up in a cast-off cover of *Vanity Fair*, I only blame the person who did not obliterate the old title on the back, as I should blame the person who exhibited a photograph produced after much "faking" as a specimen of pure photography.

Pictorial photography is fast becoming as objectionable a term as artistic or art photography, because almost as hackneyed, but until a better word is suggested, if we accept it as meaning a serious attempt to produce a picture, using photography under control and

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modification, we should all perhaps be the happier, and much rending of each other's feelings be spared.

And now for the pacification of some, may I say that the use of paint on the negative or any such extreme method so liable to be indiscreetly used, need not be resorted to, still less so on the print?

With some considerable temerity I ask your attention to some prints here which may roughly indicate some of the control which may be exercised merely by "sunning down," by "printing in," and "keeping back." I am free from claiming success for either of the finished prints, because I, knowing well their faults, show them only as examples along with direct uncontrolled prints from their respective negatives.

It might be expected that in this connection I should make mention of such a method of printing as what is known as the gum-bichromate process, in which a power to control the final result is carried to a maximum degree. In this process, as you know, either by directing a stream of water or by painting on the partially-developed print with a brush, variations in light and shade can be made to almost any extent, objectionable forms can be eliminated, and even new forms introduced; but for my own part I do not yet feel sure whether the exercise of this power is not accompanied with too great a sacrifice of some qualities of the typical photographic image, which as yet, I am so conservative as to cling to and fear to lose. I am afraid that in this great freedom to alter the mechanically produced image, very few will succeed to do anything but shock us with strange caricatures and enormities. Some there are, and these same few if they can paint with water on the gum and bichromate surface, could as well paint on paper with pigment in time-honored fashion, and save much messing and vexation.

I believe that by stopping, printing, and by toning down and arresting printing where required, light alone may be made to be far more obedient than we think. I especially want to free myself from the charge of advocating "touching up," as we understand the term, and as we see it practiced. It is one of the things most abhorent to me. And now very briefly as to *why* we should not be content with the automatically produced image. Why should interference and control be necessary?

Let me ask any photographer who can also paint if he can frankly say of any pure photograph, that it is exactly as we would have it had he painted it. Even supposing by careful choice of subject we have secured perfect composition, we have then merely the grammar without fine language, merely the rhyme and metre without the poetry.

It should not be necessary for me to here remind you that Nature is one thing and Art another. A facsimile and a picture are very different matters.

But the strong point, the essential character of photography is its literalness.

This predominant quality in photography is not only not required, but is even *in a measure* antagonistic to an artistic rendering. I forget who it is that has described golf as the putting of little balls into little holes, with instruments particularly unfitted for the purpose, but I have thought perhaps that some of us are in no better plight than the golfer—we strive to express our impressions artistically with a process particularly unfitted for our purpose.

Art is personal, individual, and everything personal must of necessity possess emphasis. Consciously or unconsciously, every individual, in thought, or word, or act, places emphasis on that which affects him most, according to personal bias and inclination, but the lens and the plate know no emphasis, all is treated equally and without preference. It is in order to break down this literalness, and to emphasize some idea, some part, some effect, that I require some method of control, and the necessity for it justifies its use.

Let it be understood that I am not asking that every picture be of a dramatic, striking character. There are pleasing effects on the quietly lighted gray day, as well as under a riven storm-cloud, and it may be that it is the very quietness and grayness which it is necessary to emphasize. I would go so far as to say that if the first hastily made proof from my negative pleased me entirely, instead of congratulating myself on so lucky an achievement I should at once suspect my own taste and judgment of being blinded by the pleasing arrangement of parts, the exquisite rendering of tones, or some such quality. The very fact that the photograph, however beautiful, however at first sight satisfactory, is made by a machine incapable of emphasis, incapable of feeling, preferences, or of expressing personal bias, makes it unaided, the most mechanical of crafts, and only a possible artistic means when powerfully controlled.

A fortunate chance of lighting a happy composition may have been taken advantage of in making the negative, but then of these two conditions my photograph gives me but a literal rendering, therefore my photograph must be inartistic. Its very literalness is its undoing.

But one may say emphasis may be given by differentiation of focus altogether, and effect of light and shade accentuated by suppression of focus altogether, which course of action by your leave I should claim as a method of control, considered by some as great a heresy as any other, whilst local development too often, as far as I have been able to observe, controls the would-be controller.

I believe many of you will follow me when I say that again and again we meet with fine examples of photography in which there is every evidence of taste, judgment, skill, and we know their producers by name, and have seen from their hands equally good work for year by year for many years past. They have gone as far as photography will go in the present state of knowledge, but they have not thought to call in a large amount of personal control, by which they would impart at once a personal and individual character to the result, for because such act of control is not mechanical, it varies in power and truthfulness, and makes it possible for every work to outstrip its predecessor. That the exercise of such control requires no small degree of artistic instinct may be admitted, and accounts for the fact that some not so gifted never get far beyond the production of very fine work, such as they learned how to make after their first six months of practice.

Ladies and gentlemen, I am painfully conscious that in seeking to justify what has been called "photo-faking," I am like one who sets free a virulent germ which may easily spread destruction and disease in photographic ranks. I would therefore beseech all those

who have it in their power, to render this germ innocuous by stimulating and encouraging good pure photography whenever they meet with it.

I think I am right in saying that there are some disease germs which, taken in and comfortably provided for by a good sound constitution, produce vigorous growth, but do not kill. So give us all, please, a fine vigorous photographic constitution, but watch over and occasionally give corrective medicine to the weak whom my germ might destroy.

Not too many germs, but just germs enough, not too much control, but just control enough, in the right hands, will do photography as a whole much good.

I hope what I have been saying will be taken only as suggestive to those whom it may concern, and whilst I think it is hardly likely any discussion will follow, I trust each speaker will first provide for himself an antagonist, and with some one prepared to answer his objections and questions.

I have done my share and more than my share of speaking, and would fain leave the rest to others, albeit I would endeavor, if required, to make good any imperfections of expression, of which I may have been guilty, with the same courtesy which you have kindly extended to me in youratten tive audience.

He Had Photographs to Burn.—Talking of the blunders of subordinates, writes DBJTX, in the *News*, a theatrical manager, a friend of mine, told me the other day that he had had printed a number of costly photogravures of photographs of his company, and had had them expensively framed. Being busy behind the scenes when they brought them to him, he called a stage attendant and ordered him to place them in the *foyer*. On entering the theatre in the evening, he noticed the photographs were not visible. He hunted up the attendant immediately, and asked him where they were "Shure I burnt them, sor," was the reply. "Burnt them, you idiot. What did you do that for?" "Bekase you told me to," answered the attendant, in an injured tone. "I didn't tell you to burn them," said the manager impatiently. "Faith, sorr, ye did. Ye told me to put them in the foire, and I wint right off and put them in the stove beyant."

How We Photographed the Baby.—The photographer fastened the baby in a suspicious looking mechanism which he averted would hold the baby comfortably, and at the same time be invisible (I could not help thinking what an admirable wife and mother such a machine would make), then stepped back and looked inside the camera to see if its insides were all right. Failing to discover a fit of indigestion or other weakness in the machine he shook himself free from the mantle of cloth, stepped to one side, ran his fingers through his hair, grabbed the rubber vermiform appendix that opens the eye of the instrument and remarked in a weary sort of a way, as though he anticipated a struggle: "Now look pleasant, please."

I gazed at him pityingly. No need to ask that man whether he was married and the father of children.

"You don't suppose that baby understands such language as that, do you?" said my wife witheringly.

"I always thought I spoke fairly good English," the photographer answered. "However, perhaps the baby will understand you better."

"Well, I should hope so," answered the little lady. Then she smiled upon our infant and said: "Didn't its cutesy wootsey litley bitsey soulsum woulsum want to smilesy wilesy sumsum wumsum for its momsum womsum?"

Our heir apparent gave one look of disgust, curled the northeast corner of her mouth up into her southwest ear, closed her eyes, turned red and yelled bloody murder in choicest baby talk.

"Doesn't seem to work any better than mine, does it?" said the photographer with a sneer.

"Humph!" ejaculated the little lady. "She's afraid of you—and no wonder!"

Then the photographer tried again. He put a pet cat on top of the camera and a canary bird on the chair beside it. Then he stirred up a sleepy monkey that reposed in a corner, wound up a mechanical bug and started it across the floor, tooted on a tin horn, beat a toy drum and danced a jig. No use. The baby simply looked more disgusted still, and yelled the louder.

Then the little lady sang a song, but without effect. Perceiving that a variety show was in order I took a turn then, and rendered my inimitable imitation of a man trying to recite a poem. Then the photographer performed some clever juggling tricks, the most wonderful of which was extracting two dollars on account from my own pocket (I had hoped to get the photographs charged), and the little lady followed with "Curfew Shall Not Ring Tonight." On this I made an impromptu parody entitled "Baby Will Not Smile Today," and then the little lady suggested that we give her the legitimate. We did. First we gave the dagger scene from "Macbeth," then the sword scene from "Richard III." We closed with Antony's oration, with the little lady as *Antony*, myself as the populace, and the photographer as the corpse. He said he felt like one. The baby "lent us her ears" all right, but look pleasant she would not. Every alternative having failed, I at length resolved upon what I call my "last resort." I got down on my hands and knees and let the youngster toy with my hair and mustache. And then she smiled.

Our friends say it is a splendid picture of the baby, but an awfully poor one of me.—T. WINTHROP in *Truth*.

NOTES.

Collodion Printing Papers were first invented in 1865 by G. Wharton Simpson.

When Setting, the sun is about 420 times less luminous than at noon on a summer day.

La Photographie Instantanée. Par Albert Londe. Paris Gauthier, Villars et Cie.

A complete treatise on the theory and practice of instantaneous photography.

"The Inland Printer" for June gives a cover design in light brown and black, by Leyendecker, which has all the peculiar characteristics of the French—or Chéret—school of poster makers. It is one of the best of the productions of this talented young artist.

Scientific Photographs Wanted.—The Sixty-ninth Meeting of the German Society of Science and Arts will be held in September next in Brunswick, and in the exhibition to be held it is intended to include one of scientific photographs, organized by Professor Max Müller. Contributions of papers and photographs are asked from all workers on the subject.

Platinotypes.—It is always a matter of disappointment that the vigor and shadow detail shown in a platinotype print whilst wet should disappear to some extent when it is dried. A remedy is, after the complete process has been gone through and the print dried, to varnish it with ordinary negative varnish—the tint obtained will be slighter warmer, and it should therefore not be used when the coldest tones are desired, but with every other print it is a distinct improvement.

Ruskin's Four Advantages of Learning Painting, which apply equally to the practice of photography are as follows: (1) The power of appreciating fine pictures; (2) the agreeable and interesting occupation of many hours; (3) the habit of quick observation, and exquisite perception of the beauties of nature; (4) the power of amusing and gratifying others.

The Rochester Arts and Crafts Society recently held an exhibition of the photographs collected by Mr. Geo. Timmins of Syracuse, N. Y. This collection has already become famous in the country, and deservedly so. Mr. Timmins, with the laudable desire to convince the public "that photography has fairly earned the right to a place among the Fine Arts," collected the best works of the most distinguished photographers of the world.

To Deepen Prints.—If you find a print which, after being toned and fixed, has not been printed dark enough or is weak, do not throw it away, but after the usual final washing and drying well damp it again and then squeegee it on to a piece of fine ground glass which has been previously well washed and polished with "French chalk." Of course it alters the tone a bit, but it strengthens the print wonderfully, and also gives such a delightful matt surface.—E.B.N., in *The Photographic News*.

How to Reduce Over-Printing.—The print should be placed in the following bath:

Cyanide of potash	1 grains
Liquor ammonia	5 drops
Water	1 pint.

Allow to remain in this solution until the requisite amount of reduction has been obtained, and then give several washings in clear water or ten minutes under the tap, and you will have a successful result, and save your print.

King Louis Philippe's photograph, which is a very rare object, has been sent to the Carnavalet Museum, Paris, by a collector, in whose possession it has remainded for many years. It is supposed to have been done either by Daguerre himself or by some member of the royal family to whom he had communicated his process. The portrait dates from 1840, and in it the citizen King is represented sitting in an armchair. He is dressed in ordinary attire, and on a stand near him is one of those very high hats which were again in fashion during the Second Empire. No reproduction of this unique daguerreotyped photograph will be permitted.

Drying a Negative.—Is it generally known that when a negative has been fixed and washed it can be quickly dried without the use of alcohol by laying it face upwards on a smooth surface and placing a piece of non-fluffy blotting paper upon the wet surface? Rub lightly, gradually increasing the pressure until the moisture is well absorbed. It may then be placed in a current of air, and will readily and rapidly dry. A cambric handkerchief or a clean towel may be used in the same way.

Architecture.—Choose a dull day.

Take a focusing glass and use it freely. In landscape such a thing would be an abhorrence. When the spot you are focusing is dark, rub the inside of the focusing-screen with a little water, or, better, oil.

If you still cannot see, get a friend to hold a lighted match close to the important details and focus on that.

Use but little pyro in the developer, and water it well down.

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Print on a detail-giving surface, unless your picture is a broad one and more for massing of light and shade than anything else.

To Restore German Gilt Frames.—Cheap picture frames, known as "German gold," can be nicely restored by varnishing with the following preparation:

Coarsely powder thirty grains of gamboge and a half an ounce of dragon's blood, and then add thirty grains of turmeric powder, and two and a half ounces each of shellac and sandarac. Place in a bottle with half a pint of methylated spirit, shaking it at intervals, for about a week. Then add half a pint of turpentine, and allow the mixture to digest (with occasional shaking) for about a week, keeping the bottle in a warm place. Then filter the mixture, and add four ounces of mastic varnish. Apply with brush.

To Clean Engravings.—Discolored engravings can be bleached before copying by immersing them for a minute in *Eau de Javelle*, and then washing them thoroughly in a very weak solution of hypo (about 1 in 20), followed by clean water.

Eau de Javelle is made thus:

Sodium bicarbonate	16 ounces
Water	40 ounces

Boil in a clean saucepan for about fifteen minutes, and then stir in four ounces of chloride of lime, being careful to avoid lumps. When cold the liquid is ready for use, and may be used over and over again.

Simplified Procedure with the Artigue Process.—Very good and extremely convenient and economical pictures can be obtained in the following way by means of the Artigue process. Bichromate of ammonia is dissolved in concentrated alcohol, and spread over the black side of *papier velours*. The paper dries in a very few minutes, and is then exposed to the light behind a thin negative from one-quarter to three quarters of an hour, preferably using an actinometer, after which it is soaked in cold water for half an hour and laid on a piece of glass. It is then rubbed over very carefully with a wad of cotton wool dipped in cold water, which gradually develops the picture, and by occasional rinsing with cold water, a complete and clear, vigorous positive at last appears. If carried out in this way the process will be absolutely certain, and give the most beautiful results.—*Photographische Chronik*.

Accessories for the Tripod.—It is one of the primary necessities of the camera tripod that it should be stable and uninfluenced by wind, and in order to ensure this, it is a good plan to tie a piece of string from the center of the head, and allow it to depend to about six inches from the ground. If a loop be then made in this at the lowest extremity, the foot may be placed in it and pressed down immediately before and during the exposure. Another plan is to suspend the rest of the kit in the bag by a string from the head, but the former method ensures more steadiness.

Another accessory for the tripods is three pieces of cork or rubber which may be fitted on to the end of each leg when it is being used on polished surfaces, or where damage is feared.

These may be cut with the base at an angle so that it is always in complete contact with the floor, and so avoids slipping.

If the camera screw be tied to the tripod head it will save much annoyance, for camera screws have a nasty way of hiding themselves when they are suddenly and quickly wanted.

The Maine State Fair proposes to offer premiums for amateur photographers only on the following classes for competition at the coming State Fair, August 30-31, September 1-2-3, and solicits co-operation in the form of specials, upon the following classes, placed under such conditions as may be deemed best for the interests of the exhibitors.

Collections.—Landscapes—4 x 5 plates and under, 5 x 7 plates and over. Interior.—4 x 5 and under, 5 x 7 and over, collection portraits, collection animals. Singles.—Landscapes.—4 x 5 and under, 5 x 7 and over. Interiors.—4 x 5 and under, 5 x 7 and over, portraits, animals. Singles not to compete in collections. All work to be done, without assistance, by persons entering same. The firm name and specialty should be attached to offers. Full particulars can be obtained from G. M. Twitchell, Secretary, Augusta, Maine.

Artistic Lighting. By Jas. Inglis. Price $1.00 cloth. The Photo-Beacon Co., Chicago. Mr. Inglis endeavors in this little work to set forth the principles of artistic lighting in portraiture, and there is no doubt that a careful perusal of what he writes will result to the advantage of many professional photographers. The book is illustrated with bromide prints of Mr. F. Dundas Todd, the editor of the *Photo-Beacon*, and are intended as examples of artistic lighting with daylight and flashlight.

The second portion of the book is devoted to "at home" portraiture, and the instruction and advice given therein will be found valuable by the amateur as well as the professional.

Lessons in Genre.—As a help to the learning of how to compose genre pictures, we remember to have seen it suggested years ago, somewhere, that it would be well if photographers sometimes took a copy of a celebrated picture and tried to reproduce it from life. The first attempts would be exceedingly crude and the results an abomination to the artist who painted the picture so copied, but the lessons which would be learned would be above price. This process would teach us a great deal that we should hardly be likely to learn in any other way. Say, for example, that we wish to copy the picture called "Bubbles." The arrangement of the background and accessories will be a good lesson to begin with; then there will be the studying of face, figure, and form until one be found sufficientiy near in likeness to the original to pass muster; then the dress, every detail in exactness and arrayed and draped like Millais' figure—all this will be excellent experience and useful in all ways.

Stripping Films.—In Eder's *Jahrbuch*, Obernetter suggests the following method of stripping negatives with the aid of formalin. A mixture of 50 parts of for-

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malin and 300 parts of water is made, and in this old negatives are bathed for from six to ten minutes, whilst freshly developed negatives only require from three to five minutes, after which time they should be well rinsed, and then either dried, or else, whilst still damp, coated with a solution of 200 parts of hard gelatine, which should be allowed to swell for twenty minutes in cold water, well pressed and dissolved by heat in 1000 parts of water. When dissolved, 100 parts of alcohol, 20 parts of glycerine, and 20 parts of glacial acetic acid should be added. The negative should be coated to a depth of about one-twelfth to one-eighth of an inch with this solution on a levelled stand, and allowed to thoroughly dry, and then the edges cut round, and placed in a mixture of 50 parts of glycerine, 500 parts of alcohol, and 1200 parts of water, when it will soon begin to frill, and it may be stripped and transferred to another sheet of glass, or else used as a film negative.—*The British Journal of Photography.*

Carbon Printing.—Little use is made by amateurs of the continuing action of the light after exposure of a sensitized piece of carbon paper, but the professional printer at no time forgets it. It may be calculated that if a negative requires a "four tint" exposure by the actinometer, this will be obtained by an actual "three tint" only to light, if the print be allowed to stand undeveloped in a dark damp atmosphere—at least one that is not abnormally dry—for twelve hours. If the undeveloped print be left longer, say for thirty-six hours, there will be a certain farther continuing action, but not in the proportion given above, and of course there will also be the ordinary hardening of the tissue. It is not therefore advisable to postpone development more than twenty-four hours at the most, and it may be roughly estimated that in this time the continuing action has proceeded one-third - that is, if prints are exposed one day and developed the next, two thirds only of the exposure need be given, assuming that the paper is in the normal state freshly sensitized.

A Declined Engagement.—One of the most noted women lecturers in the east is having a great deal of amusement out of a letter she received not long ago from an unheard-of little town up in Maine. The writer of the letter said: "Dear Lady—We want to git up some kind of an intertainment for the benefit of the band boys in our town and it is thought that mebbe one of these sterryoptican pickcher lecktures by you would draw if the pickchers was good. We would want something of a lively caracter that would give the band a chance to come in with 10 or 12 selections during the leckture the whole to end with a free dance to which you would be invited. Please let me know your turms by return of male and say if you can come on the 13th inst. P. S.—The band will meet you at the depot and give you a sirenade at the hotell." When the lady wrote politely declining the engagement, she received a second letter, saying briefly: "Yours to hand. It's all right, for we have concluded to turn the whole thing into a dance and cake walk. We'll give you a chance some other time."

Stains on Negatives.—The yellow stain on negatives caused by prolonged development with a pyro solution is often very valuable in giving contrast, and seemlessly hopeless negatives may be printable if this is present. If it is not needed it is best removed by an acid fixing bath, and the following is the formula:

Hypo	4 ounces.
Bisulphite of sodium	1 ounces.
Water	20 ounces.

If, however, the stains are not resulting from pyro they must be removed by thiocarbamide. The solution is made up as follows:

Thiocarbamide	½ oz.
Citric acid	60 grains.
Water	12 ounces.

This will remove green fog and even silver stains, and will also clear a yellow pyro negative. With ferrous-oxalate Colonel Waterhouse found that it caused reversal of the image, but a prolonged application will cause the film to float off the plate during development. There is no fear of this during clearing, however.

Standard Literature Series.—New York; University Publishing Co Paper, single numbers 12½ cts., double numbers 20 cts. Cloth, single numbers 20 cts., double numbers 30 cts. Single numbers 64 to 128 pages, double numbers 160 to 224 pages.

These books have been brought out for supplementary reading in grammar grades. The series consists of two distinct classes of books. *First*, complete and unabridged selections from standing authors. In this class are included "Evangeline" and Hawthorne's "Sketch-Book" (selections), edited by Prof. Edward Everett Hale, Jr; Tennyson's "Enoch Arden," and selected poems; Scott's "Lady of the Lake"; Irving's "Tales of the Alhambra" (selections); Hawthorne's "Twice-Told Tales" and "Wonder-Book." *Second*, standard novels abridged for grammar school reading. The object in editing these novels has been:—1st, to cut out the tedious details, which often prove so tiresome to young readers, but to leave *a complete story in the exact language of the author*, short enough to be read in the limited time of a school term. 2d, to cut out all incidents and allusions which are of a questionable character and unsuited to children. 3d, to add notes explaining every historical and classical allusion, so that the child will have no difficulty in understanding what he reads. 4th, to offer the novels at so reasonable a price that every school can afford to buy a set. These books have been very much improved for school use by being reduced in length, and the fact that it is not the complete story, but an abridged form for use in schools, is clearly set forth on the title-page

The plan contemplates furnishing standard literature for all the grammar grades, selected to meet the particular views of teachers, as to proper subjects for supplementary reading. The entire period of English history will be covered by a series of historical novels, each prefaced with a historical sketch and a map of England at that time, thus enabling the teacher to correlate history and geography at the same time. The history of the United States will be illustrated in the same way, as nearly as possible. The history of France, from Louis XVI. up to the present time, will also be represented. Prof. Everett Hale, Jr., Ph.D, Professor of Rhetoric and English Literature at Union College, has supplied several numbers with introductions and critical and explanatory notes. Paper, 12½ and 20 cents. Cloth, 20 and 30 cents.

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TRADE NOTES.

Carter's Photo Library Paste is a sticker.

J. C. Millen has removed to Denver, Colorado. His blue print paper seems, if possible, to have been improved by the change.

The Manhattan Optical Co. of Cresskill, N. J., sends us a copy of a neat little catalogue containing descriptions of the cameras, lenses, and photo supplies that they manufacture. Every amateur should purchase a copy.

The Photochrome Engraving Co. of 162 Leonard St., City, should be consulted by all photographers desiring perfect half-tone reproductions of their work. The members of this firm thoroughly understand the requirements of the photographers aiming at artistic results.

Moran's Bargain List No. 47 should be obtained by every photographer who is desirous of picking up something good at a very low price. Write for one to R. H. Moran, 22 East 16th Street, New York City.

W. F. Ashe of 76 East 9th Street, New York City, makes a specialty of backgrounds for carbon platinum affects.

The Optical Glass Works at Jena send us the following: The recent efforts of opticians to improve photographic objectives have created a demand for various kinds of glass differing in their optical properties and chemical composition from the flint and crown glass formerly used. In the manufacture of most of these glasses which are used in the construction of all modern anastigmats, many technical difficulties have been overcome, but it has not been found possible to produce the glasses free from small air bubbles. Such air bubbles in no way affect the optical properties of a lens, and as the new lenses can only be made of these special kinds of glass, their improved optical qualities must far outweigh any æsthetic consideration arising from the appearance in them of small air bubbles.

"Facts and Fiction," "that sprightly western monthly," of Chicago, celebrates the beginning of its fifth volume with the July number, by appearing in a highly artistic cover of three colors. An amateur photographers' contest is inaugurated, for which they offer ten prizes, several of which are cash. It is believed to be the best list of prizes ever offered for a similar contest. A copy of the July issue containing the announcement will be sent free to any address.

Note Book for Photographic Exposures, published by Pancoast & Hand, 1213 Filbert St., Philadelphia, Pa. Price 10 cents.

The price of this handy little note book is so small that it should be in the vest pocket of every photographer. Each page is arranged so that one can enter in the fullest particulars regarding each exposure made. If only a few more photographers would do this as a guide in development a great many spoiled plates would be saved.

NOTES ABOUT PHOTOGRAPHERS.

Otto Sarony is carrying on the business of his father the late Napoleon Sarony.

Alfred Stieglitz is devoting nearly all his time to the Camera Club's new magazine *Camera Notes*. The first number was a decided success and every member of the club should feel proud of it.



RUDOLPH EICKEMEYER, JR

Rudolph Eickemeyer, Jr., is a member of "The Linked Ring" and is at present associated with Mr. Jas. L. Breese of the Carbon Studio. Many of Mr. Eickemeyer's beautiful landscape studies have appeared in these pages.

Death of Henry Hunt Snelling.—Mr. Snelling, one of the oldest, and at one time one of the best known workers in photography in the United States, died at the Memorial Home, St. Louis, June 24th. From *Anthony's Bulletin* we learn that Mr. Snelling was born in 1817, at the Military Post at Plattsburgh, N. Y., where his early life was spent. After completing his college education at Georgetown College he drifted into photographic work, and in the early daguerreotype days was employed in the chemical department of E. & H. T. Anthony & Company, during which time he published a journal under the title of *The Photographic and Fine Art Journal*, about the year 1851. About this time he became blind, but his interest in photography and editorial work still continued, and his contributions to photographic literature were quite voluminous. He was a man of more than ordinary literary attainments. Mr. Snelling had been an inmate of the Memorial Home since 1893.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF JULY, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

586,097. Panoramic Camera. Louis Jeffery, London, England

A camera is arranged to revolve about the center of a disk and provided with a bobbin upon which the film is wound after exposure. Suitable means are provided for driving this bobbin, and a roller is pivoted in the camera and adapted to press the film against the edge of the disk. Means are also provided for retarding the revolution of the camera.

586,248. Lantern Slide Carrier. H. T. Riley, Hackensack, N. J.

An operating handle is carried by a suitable supporting arm which is hooked towards its inner extremity and adapted to slide within the lower part of a frame. Means are provided for shifting the slides from the front to the rear of the frame and operated by a hook on said arm, and an extension-arm is carried by the handle and moves inside of the frame-work to form a groove on each side, inside of the frame to support the slides. A slide-centering stop is pivoted about midway in its length inside of the carrier frame and in the pathway of said slides, being operated by the end of the extension-arm

586,280. Photographic Print Washer. Daniel Argerbright, Troy, O.

This invention comprises a rotating casing adapted to be completely filled with the washing liquid, said casing having outlet and inlet openings. Means are provided for automatically and intermittently rotating said casing for a portion of a revolution by the action of the washing liquid which passes through said casing and escapes at said outlet opening.

586,303. Photographic Negative Washer. F. C. Barnum, Morrison, Ill.

A negative washer is formed with vertical side-pieces, the adjacent faces of which are grooved longitudinally, alternately arranged inclined plates being located in said grooves. Each plate is of a less length than the length of said side-pieces and having its upper end provided with a vertical flange. The ends of the flange extend over the ends of the side-pieces and are secured thereto.

586,953. Phantoscope. C. F. Jenkins, Richmond, Ind., and Thomas Armat, Washington, D. C.

This is an apparatus for exhibiting pictures so as to give the impression to the eye of objects in motion, and comprises a picture-carrying surface, and means for supporting the same and permitting it to be moved so as to cause the pictures or objects thereon to be successively exposed for the required interval of time in an illuminated field. Mechanism is arranged to intermittingly quickly move said surface at short intervals for exposing or exhibiting the pictures in the order of their succession, and for holding the surfaces stationary during the interval of illumination of each picture, the interval of illumination of the picture being made to exceed the interval of motion or change.

586,962. Photographic Developing Tray. W. V. Esmond, New York, N. Y.

This is a film-submerging device adapted to application to photographer's trays, and comprises a roller journaled in two springs, one at each end, which are constructed and arranged to be detachably attached to the sides of the tray and to be held thereon by reason of their resiliency.

586,963. Photographic Vignetter. W. C. Farrand, New York, N. Y., assignor to E. and H. T. Anthony & Co., same place

In a vignetting apparatus the inventor provides a tube having a slideway pivoted thereto, a shield being supported on a rod which is adapted to slide through said slideway. Means are provided to elevate the shield and additional means are provided to oscillate the tube on its axis.

587,056. Photographic Finder. Lodewyk Jan Rutger Holst, Amsterdam, Netherlands.

A photographic camera is provided with a view finder having a stationary ground-glass screen on the upper side of the camera body, a cover having a mirror on its underside being provided for said screen. Said mirror is adapted to reflect the image on the ground-glass screen horizontally, and an additional cover is provided for the mirror whereby said view-finder may be used with or without the latter.

587,221. Automatic Photographic Camera. Margarite Mann, New York, N. Y., administratrix of Chas. Mann, deceased.

This invention comprises a camera, a lens and shutter, a motor, and a shifting device for the shutter operated by the motor and arranged to regulate the time of exposure at the lens. A plate receptacle is employed, and a plate-holder provided with gripping devices, the latter being arranged to receive a plate from the receptacle and carry it in the field of the lens. A device is arranged to release the plate from the grippers, said receptacle, holder, and releasing device being operated from the motor.

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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

OCTOBER, 1897.

Number 10.
SINGLE COPIES, 38 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.



THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH ST. NEW YORK.

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Sweetheart Adhesive Cloth

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THE PHOTOGRAPHIC TIMES.

VOL. XXIX. OCTOBER, 1897. NO. 10.

AN ADAPTATION OF TELESCOPE LENSES FOR PHOTOGRAPHY.

BY HENRY SKILLMAN CURTIS.



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GRACE KIMBALL. By SARONY.

IN the old days of wet plates and slow and laborious processes, picturetaking was beset with so many difficulties, that those who took up the pursuit for their own pleasure were few and far between. But such a condition of affairs had this one crowning advantage. A man was obliged to do his own work, and in order to accomplish this, he must, in the first place, as a student, understand the science of his pursuit. Frequently thrown on his own resources, one who did not comprehend the principles of his apparatus, the difficulties to be encountered, nor how to meet and overcome them, could not hope to succeed.

Consequently there was a constant stimulus to further study and research and the improvement of apparatus. To-day, with the removal of difficulties and drawbacks in picture taking, much of the old enthusiasm for investigation appears to have died out, among the amateurs, at least.

For this reason, it would seem that anything in the way of experiment, or departure from the regular lines laid down by the professional, should be encouraged in every way possible. In the hope that some of those who are fond of such experimental work may be interested in the adaptation of lenses for different uses, the following paper has been written.

The difference between a telescope lens and a photographic lens, lies chiefly in the degree of correction for chromatic and spherical aberration. The former is ground to give an image free from visible aberration, and of extreme sharpness, capable of being magnified by an eyepiece. The field, however, is somewhat curved, so that only a small portion can be in the focal plane of the eyepiece at one time. A glance at Fig. 1 will explain this more clearly.

Let A represent the telescope objective, the convex crown glass (a) and the concave flint glass (b), being placed as indicated, the usual position in lenses of this type. Also let B represent any distant object. An image of B will then be formed at the point C, but will be curved somewhat as indicated, only the middle portion being available for observation by the eyepiece D. The field, therefore, of such a lens is limited, but as astronomical objects are usually small, their images in the telescope rarely exceed the limits of clear definition. If, however, the image is of considerable area, it is evident that it cannot be focused sharply on a plate at C, for, if the center be in focus, the

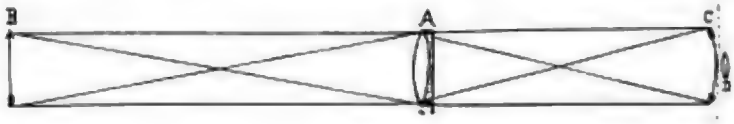


FIG. 1.

edges will be blurred, and *vice versa*. In photographic parlance, "the field is not flat."

A few years ago it was the writer's good fortune to come into the possession of a fine telescope lens, two inches in diameter, and thirty-six inches in focal length. The flint and the crown glasses were not cemented together, but were detached, thus inviting ex-

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FIG. 3.

periment. In the course of a research on certain properties of lenses, under the direction of Professor Rood of Columbia, it occurred to me to try how good a photograph such a lens would make.

It already had been ascertained that, if the concave lens were placed in front of the convex lens, the area of sharp focus in the image would be much increased. The objective was set up in this manner, and a picture taken, but without any expectations of clear, sharp results, as I had labored always under the mistaken impression, so common to amateurs, that good results could be obtained only by the use of fine and expensive apparatus. The results, however, were so satisfactory, that it seemed worth while to follow the matter up. A series of experiments followed, the outcome of which has been a good deal of valuable knowledge concerning lenses and their ways, and the addition of an excellent photographic objective to the writer's outfit.

To sum up the matter, it was found that the defects of curvature could be effectively corrected by changing the relative position and distance apart of the components of the objective. A reference to Fig. 2 will show how this may be done. Let the same letters represent similar objects as before.

The concave lens (b) is placed in front of the convex lens (a), the concave surface turned outward. The rays of light coming from the object B are bent outward, and made more converging, and this in turn tends to bend back the edges of the field and render it more flat.

When a telescope objective is to be used for photographic purposes, it is necessary also to alter the correction from that of visual to that of actinic rays. This is accomplished in

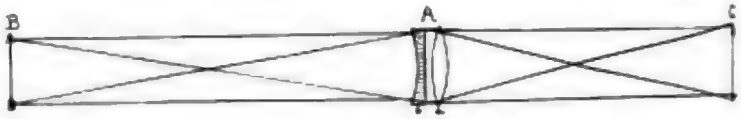


FIG. 2.

the case of large glasses, by adding a secondary convex lens of crown glass. This slightly counteracts the action of the flint lens, rendering the objective under-compensated for visual, but correctly adjusted for photographic purposes. The use of an additional lens is unnecessary for the correction of small glasses and for such purposes as an amateur would wish to accomplish. The desired result is obtained by the degree of separation of the flint and crown glasses.

The correcting power of the concave lens decreases the further it is removed from the convex lens. Consequently a point can be found where the former will act as a corrector for the actinic or chemical rays. This point can be determined readily by experiment. In the adjustment of the objective described above, about one millimeter, or one twenty-fifth of an



FIG. 4.

inch, was found to be the right distance apart of the components.

A working aperture of slightly more than one-half the diameter of the lens, was the largest that could be used. This, however, was sufficient for instantaneous work, while with a smaller stop the definition was perfect. An 8 x 10 plate was covered without difficulty, while with small stops larger sizes could be used. With lenses of comparatively short focus, the greater curvature of the surfaces causes a decrease in defining power, and smaller plates and stops must be employed.

In many instances the components of telescope and spyglass lenses are cemented together by means of Canada balsam. Separation can be effected by soaking the objective in warm alcohol. This operation had better be performed by an optician, as there is much danger, both from the alcohol exploding while it is being warmed, and the risk of cracking and ruining the lens.

The two pictures which accompany this article were taken with the objective above mentioned, and give some idea of the effects that can be obtained by such means.

There is certainly a great fascination in working with apparatus that has been planned and adjusted by oneself, and the amount of pleasure and information thus obtained is surprising.

ENLARGEMENTS BY AMATEURS.

BY R. R. BOURLAND.

ONE branch of the beautiful art-science—photography—which is within comparatively easy reach of the amateur, is not made as much of as it deserves to be, both for its possibility of pleasure-giving power and in its opening a way for economy. It is the process of enlargement, a process greatly abused in a professional way by the production of a mass of very displeasing portraits spoiled by the misapplication of crayon or brush in the hands of unskilful workmen, catering to the trade of people whose taste has been spoiled by the blandishments of salesmen who "talk-up" pictures in gaudy frames, the portraits being mostly hard and stiff lines worked up on a basis of the bromide enlargement and ruined in the working up. This is not the kind of work to which I refer, but I do refer to the production of large photographs, choice views, landscapes, for ornamental and decorative purposes, which show the taste and skill of the *artist*.

There are many negatives of only 3 1/4 x 4 1/4" or 4 x 5 inches in size, each of which has the complete germ of a landscape, good perspective, correct light and shade, proper composition, with detail so perfect that the loss of its fine definition through the process of enlargement only gives an artistic softness to the enlarged picture. Such a picture properly matted and framed makes a gift which is worthy both the art of the giver and the thanks of the recipient. The economical feature is found in this: (*i. e.*), there is a tendency on the part of the amateur to desire a camera larger than the usual "4 x 5": his ambition reaches out to the 8 x 10 size, of plate and print, while in all ways the use of an 8 x 10 view camera by an amateur is an expensive luxury. New trays, larger quantities of chemicals, paper, become a large item of expense, card mounts also, and the result (possibly a good one) is the production of fewer pictures, there is less experimenting and many desired views are not taken, but when the 4 x 5 camera is used, about eight times as many negatives can be produced at the same expense, and of these the *choice* can be used to make enlargements from, thus in the case of all desirable views, the 8 x 10 size may be reached by a less expensive road, and the size is by no means one limited to 8 x 10 but is at the pleasure of the operator.

Again the enlargement may be made from the choice part of the negative, the undesirable edge or corner may be left out or the proportion of the composition changed, a weak negative may be made to produce a strong print by proper exposure and development of the enlarged picture.

A peculiar fact also I have noticed, to wit:—that in a properly illuminated, focused, exposed and developed enlargement the perspective of the picture seems to be improved, there is a sort of stereoscopic effect, such as is obtained by looking at a print through a good reading glass and all objects in the distance seem to be much brought out, as in viewing a scene through a telescope.

These are the main points and I will say as to the details that there is great pleasure in making the enlargements, the learning how is a pleasant process. The first requisite is the enlarging lantern, simply a "magic lantern" adapted to the work; this is for night work.



PORTRAIT OF MY WIFE BY LEE FERGUSON

Sunlight can be used, with only the objective of the lantern, by those who can find time to work at it in day-time; here can be saved the expense of "condensers," which are necessary only in connection with artificial light. I have a pair of 8" condensers, 6" will do for 4x5 negatives, 8" glasses will answer for *almost* all of a 5x7 negative. I find my Zeiss anastigmat lens (No. 4, series 4) to be an excellent objective to use with these condensers and to produce good illumination and definition of a 4x5 enlarged to 12 x 15.

The process is simply to place the negative in the enlarging lantern, as if the negative were a lantern slide, and to project the image in the dark on to the sensitized paper as if it were the screen, the focusing is, of course, done on unsensitized paper substituted with the sensitized paper when all is ready for the exposure. The length of exposure is determined by experiment with "test" pieces, and the development is best done strictly in following the directions given with the particular paper used.

The steel engraving effect produced on the best "platinobromide" papers of the present day is astonishing to the workers and to the friends who receive the finished pictures. Many such an one ornaments the walls of well furnished rooms, and they do not suffer in comparison with good engravings, with the added charm of local and personal interest.

It is impossible to illustrate by pictures the points of this article as the size of the page does not admit of the production of the enlargement, hence only the original negative effect could be here shown, but surely it can be seen without illustration, that the scope of the work of the amateur is greatly broadened by the use of this process.

Not the least benefit to be realized is the effect on the photographic exhibitions. The small size of the average amateur picture makes an exhibition of the originals rather unsatisfactory; it takes too many such to fill any reasonable amount of space, but the many gems which really exist among the "4 x 5's" call for some adequate way of exhibiting them, and no way is so satisfactory as this method. It offers the opportunity of making the finished picture of a reasonable size for wall exhibition, without resorting to professional aid and also offers great opportunity for "working-up" the print by skillful exposure and development of the print as well as in the original negative.

The fullest instructions for making enlargements will be found in the files of the TIMES and the ANNUAL or may be obtained from the manufacturers of any of the bromide papers.

Beggar: Can you help a poor man to—

Pedestrian: I think you have touched me before.

"Possibly, sir; possibly. You see I'm a stranded photographer, and the old habit of retouching clings, sir."—*Philadelphia Record.*

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ON THE SOUTH SIDE. BY H. G. ROGERS.

PART II.

THE discussion of the best means to keep out the sun's direct rays and at the same time to permit the incoming of sufficient diffused light, will be carried out in this paper, the first paper having been devoted to an introduction of the subject, *i.e.*, the possibility of using a south light in portraiture.

When I first leased my studio, I confess to having felt certain misgivings as to the ultimate result; the light was harsh, the first few negatives the incarnation of *chalkiness*, the shadows utterly wanting in smoothness and limpidity, and this with the direct sunlight carefully filtered through white sheeting. On cloudy days, the light was most satisfactory, for the large open space in front of my windows gave a quality to it that is only to be obtained at rare intervals with a clear northern exposure. I do not know how it may be explained, but on such days there seemed to be a body of diffused light coming from the sky which did not possess the quality possessed by that which comes from the northern portion of the sky. The latter is of course a reflected light and is always blue on cloudless days, while it ranges from white to dark gray (if I may be allowed to use these terms,) on days when that part of the sky is covered with clouds. The quality which my light had, was most actinic, besides giving me the softest effects and the deepest shadows with half-tones which would satisfy the most difficult taste.

I set to work to "manufacture" a light possessing the qualities found on cloudy days, for unfortunately a New York winter as a general rule abounds in sunshine. Of course, not having a "top light" I was forced to graduate my incoming light from the upper part of the windows down to the lower part, so that I should get more light above than nearer the floor. There was necessarily no question as to screening the direct rays of the sun, the question was, what was the best medium? I tried different material, such as cheese cloth, cambric, sheeting, window-screen cloth, and ran through the gamut of different colors, such as light yellow, dark blue, red, green, etc.

Given a large area of glass, the most advantageous method of procedure I found to be as follows: First, obtain the required amount of "paper cambric" and stitch it together longitudinally if the windows are very wide;



FIG. 1.

then dye the material with brown aniline dye. The amount of pigment is a matter of experiment on account of the fact that the cambric varies in thickness; when dyed, the material should be of a light brown or ochre color, and of the correct transparency, should only just prevent the sunlight from being noticeable on the face of the sitter. The solution may be placed in a very large shallow vessel and the cambric drawn through slowly and evenly.

Care should be taken because the solution is apt to color the material unevenly. The latter may now be put on to rollers used for window screens and located so that it may be drawn up over the windows. These screens are of course only to be used during the sunlight and during the hours when the rays strike the interior of the room. It will be necessary to possess two thicknesses of screen for the lower portions of the windows, while the upper portions require but one thickness; but the auxiliary screen should be white. I need scarcely refer to the days when there is no sunlight and when very thin screens of cheese cloth may be used; as to the color of the cheese cloth, my experience points to orange as the best, but the individual taste of the operator should be consulted, for

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the difference between the light filtered through yellow to that filtered through blue is very great, the former requiring some practice before it can be used at all. The results, however, vary widely, the former giving transparency in the shadows and soft high lights which are extremely artistic. The length of exposure should also be attended to, as over exposure simply nullifies the effect of the yellow screen. In my own practice I prefer to use screens about four feet high and six feet long; screens that are so constructed that they will stand alone on any part of the floor. By combining the latter with yellow *window* screens, I am enabled to obtain a great many different effects, utterly impossible with ordinary screens attached to the windows or fixed in one position. The advantages of a yellow light are quickly noticed when a negative is taken of a person having many freckles, the latter being to a great extent absent, and the contrary being the case when a blue light is used.

As to reflecting screens to be placed on the "shadow side" of the sitter's face there is little to be said; if they are to be used to relieve the shadow the operator had best do without them.

Should a larger amount of top light be desired it may easily be obtained by constructing a semi-cylindrical screen of white paper or white glossy fabric of the same length as that of the side light, and locating it permanently along the ceiling in such a way that it will receive as much light as possible from the upper part of the windows and reflect it downwards.

I am not advocating a southern exposure when the photographer is to make hard negatives; in that case by all means use a north light, develop with pyro, and adopt as a thermometer of your work the face of your retoucher, for the more contented and happy *he* is, the more will your negatives possess the qualities of patchiness! Should your artistic soul hunger for soft and harmonious effects, try a southern exposure, adopt yellow screens, time the exposure for the shadows, and develop with the following:

SOLUTION A.

Metol	¼ ounce
Hydroquinone	½ ounce
Water	40 ounces

Dissolve; after which add

Soda sulphite, granulated	2 ounces

SOLUTION B.

Soda carbonate, dried	1 ounce
Soda sulphite	1 ounce
Water	10 ounces

To develop, use 2 ounces of A, 2 drachms of B, 6 ounces of water.

Don't omit to call for fresh emulsion plates. Don't omit to stop development at the right time. Don't omit to wash the negatives well before they go to the hypo trough.

LANDSCAPE PHOTOGRAPHY. BY H. C. DELERY.

The greatest benefit photography has conferred on man is the power it has given him to reproduce nature, and there is no branch of the art which affords such possibilities, such diversity of subjects, and one in which the true artist may find a never-ending source of enjoyment. Indeed there is no lack of food for the camera, if one only searches for it, and the quest will not be a difficult one.

But there are some jealous or narrow-minded critics, who still cling to the old idea that photography is not art, rather a sort of combination of chemicals and mechanical instruments; but, let us remind the artist, that true art does not consist in the knowing how to apply colors; that it is the motive or feeling expressed in the picture which tells, and the camera and chemicals are to the photographer that which the paint and brush are to the artist; and the application of these is of a secondary nature, and no matter how proficient either may have become in their use, success will never be attained unless they possess the feeling of love of the beautiful in nature. But this feeling cannot be attained by reading or writing; to study the works of the acknowledged art masters will help some; yet, remember, art is a natural gift, not an acquired feeling.

Let everyone follow his own ideas, and if he can produce a picture which the art world will appreciate and never cease admiring, then let him be content.

Aim at individuality and do not do a thing just because some one else has done so, and always remember a picture must have unity and harmony of parts with the whole in order to become a truly beautiful landscape.

The first thing which should occupy our attention in landscape photography is composition The relation of one line to another. One principal feature should predominate, and to this converging lines should imperceptibly lead the eye and around this point, and in a way more or less connected, all other objects should

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ANIMAL STUDIES.



BY HENRY DIXON, SONS.

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ALLEGRO BY J. WELLS CHAMPNEY

be grouped in a subordinate manner. Yet the main feature should not be centrally located in the picture, better in the foreground and a little to one side. The shadows also require special study; how they fall and how they contrast with the brighter lights, and how much gradation is expressed in their depths. Aim at concentration of lights and shadows, and avoid having them scattered all over the picture. Breadth and unity of effect are beauties to be sought for in a landscape.

The foreground owing to its prominence will require careful consideration. It should be bold, irregular, and include something which will lead the attention to the principal subject, and here the artist will show his skill by placing anything that can appropriately be introduced in the picture, such as rock, trees, or even figures. Of the propriety of introducing figures in landscape there still remains a divided opinion. But this may be certain: everything depends on the nature of the subject being treated. In some pictures figures are a necessity to give them life and finish, whilst in others, they would mar their beauty and artistic effect. However, if any are introduced they should be in perfect harmony with the subject, both as regards pose, dress, and other conditions, and should be made to occupy a minor position so as not to detract from the main purport of the landscape.

Another important feature is the sky. The position of the horizon is best determined by the treatment of the subject at hand, but may be generally accepted to be about one-third from the bottom of the picture. And the sky should help the foreground in direction and general lines of the landscape.

Clouds are sometimes very difficult to retain, owing to the prolonged exposure required for the foreground; then certain makeshifts must be resorted to, such as restraining the sky in development, or making two exposures, one for the landscape proper and one for the sky. A white or blank sky never looks well, and as clouds are not always to be had when the picture is being taken, the artist should possess a number of cloud negatives for cases of emergency, yet it is best not to make a rule of this procedure, but rather wait if possible for more favorable conditions when clouds can be taken in the picture, thereby giving more realistic effects.

When the artist starts afield, he should remember the old saying, "What is worth doing at all, is worth doing well"; and if a good subject is found, first study it thoroughly, and when everything has been carefully considered, make the exposure. Nor should he stop here; after the print is taken from the developed plate, changes will often suggest themselves, and a second or more exposure may make decided improvements. Retouching the negative, though strenuously objected to by some, is perfectly permissble and legitimate; this gives

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the photographer an opportunity to overcome the many difficulties which his brother artist, the painter, does not have to contend with. A shadow may be lightened, a high light softened, a new feature added, and in general a harmonious picture made from what might have been a dismal failure.

In focusing, a certain amount of sharpness in the foreground is permissible, and rather should be sought for, but we must be careful not to allow this sharpness to extend over all the picture, the result of which would be to give it a map-like appearance. On the other hand, excessive fuzziness should not be tolerated under any circumstance. Different seasons of the year and different times of the day produce different atmospheric effects, yet each and all may have its particular charm.

And now a word or two about the apparatus. Expensive and elaborate instruments are not a necessity. A plain, common sense camera, one which can stand hard knocks and usage in all sorts of weather, is the most desirable kind. Of course, on account of the necessary travel which one is apt to do, the box should be compact and light. The many hand cameras as supplied at present are all that can be wished for. Yet by all means carry a tripod. A picture should always be studied on the ground glass, and unless the camera can be given a firm resting place this cannot be done. A rapid rectilinear lens of some reputable make should be chosen; a poor lens generally results in poor work. And as for plates, a rapid orthochromatic one is to be highly recommended. Rapid, because the artist may sometimes be called to take a view which does not permit of time exposure, and orthochromatic for these will prove a great help to obtain clouds, and giving proper gradation and tone to the landscape.

A 5 x 7 or the popular whole plate are very convenient sizes; if larger pictures are desired, these can easily be enlarged, but there are no limitations to the size of pictures, and after the print is finished, it is a good plan to take four pieces of blank paper, putting them on top, bottom and sides of picture, and move them until all objectionable parts are covered, and then trim fearlessly.

Metallic spots on an unvarnished negative can be removed by rubbing with a piece of flannel dipped in turpentine.

A LITTLE ELECTION DAY EXPERIENCE. By R. D. O. SMITH.

When last election day was approaching, some of our boys began to cast about for something attractive for the evening of election day, because, as everybody knows, all the boys will be up and anxiously waiting for the returns. One proposed to get a lantern and have the returns thrown on a screen across the street, and another suggested to fill in the time with pictures. Not that there was much novelty in either suggestion, but it was nevertheless entirely new in our town. Of course, suggestion in such a case only preceded action The boys knew where the lanterns were to be got, and a little skirmishing only was needed to find the place. The club room is located on a prominent corner, and has a corner window. Just out in the street, across a pretty broad sidewalk, is a convenient electric light pole. Another planted temporarily on the other street would afford means of hanging a big white curtain out in the street in front of the corner window. Then the question of pictures arose and means for putting the returns on slides. Of course, any number of regular slides were available, but it was suggested we ought to have some at least pertinent to the occasion and calculated to keep the crowd good natured. There happened to be temporarily sojourning in our midst, a young lady with a pronounced talent for drawing, and her fad was comical and monstrous faces. She offered to make some drawings if a glass could be prepared to take the ink. We naturally hesitated to incur the expense of photographing a great number of things which would lose interest after election night. So we attacked the problem, with a success which warrants me in offering this account of it. Others may have done the same thing, or may have done it better than we did it, but, anyhow, it answered our purpose well.

First, after various experiments we found that a thin coating of gelatine on the surface of glass would take india ink pretty well—well enough for our purpose—and, accordingly, a pile of old negatives was depleted for material. A box was filled with a solution of bicarbonate of soda and the old negatives were duly put to soak therein, being supported and kept apart by a rack of nails driven into the side of the box. In a few hours the films were ready to compromise by coming off. The old negative

glasses were then washed, dried, and duly cut up into pieces 3¼x4¼ inches.

A little ordinary sparkling gelatine was then dissolved in water. It was so strong with water that it remained fluid when cold. A little of this was flowed over the plate, which was then set up in the rack to drain and dry.

When thoroughly dry, our young lady friend proceeded to exercise her talent, but it was soon apparent that her invention would speedily collapse under the strain. She then essayed to copy some of the newpaper cartoons, but the labor of reducing them to the proper size was considerable, notwithstanding her deftness, and besides, it soon became apparent that she would tire of the job long before the desired number had been completed. It often happens that the inventor finds himself confronted with the necessity to make other inventions to avoid losing those he has made. That's why necessity is the mother of invention, just as it was in this case. We had drawn upon the resources of the club and the local newspaper office, and had gathered in a great lot of material in the shape of *Puck*, *Judge*, and newspaper cartoons, and we couldn't bear to see all this good effort wasted.

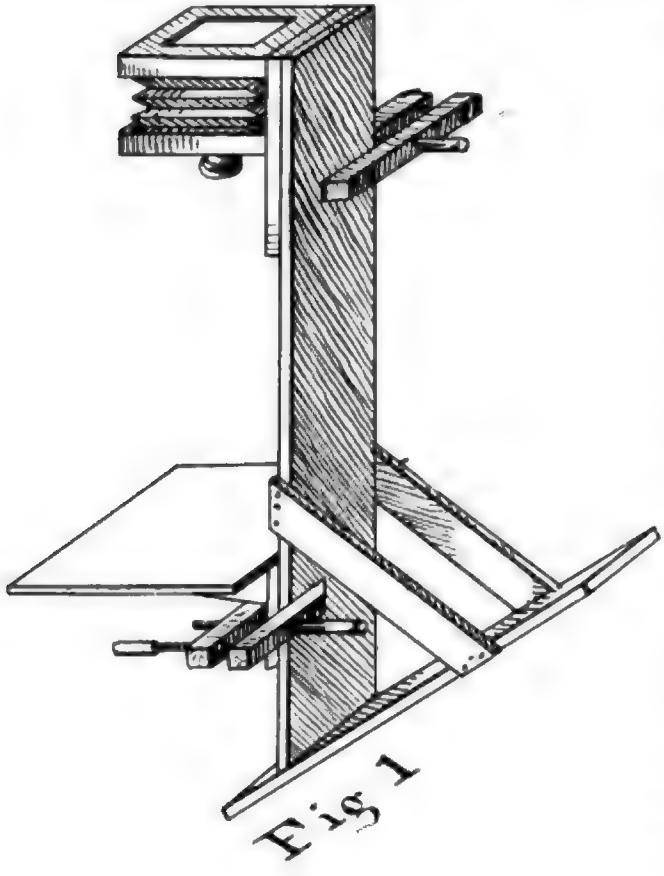


Fig. 1

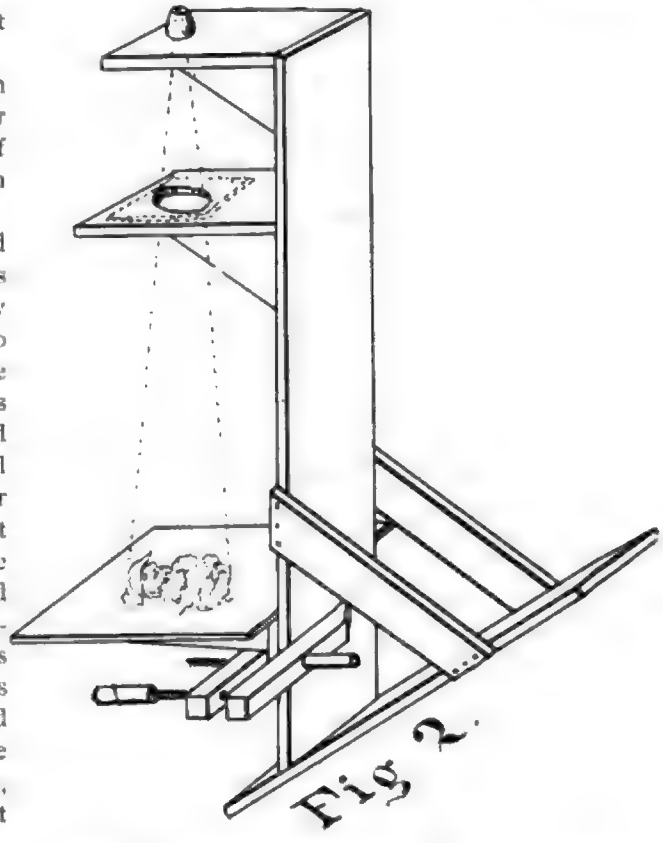


Fig. 2.

First, a couple of boards were gotten into the enterprise in the shape of a stand like

A little camera was mounted on the upper end and a sliding table to hold the picture was mounted near the other, and held in place by a common cabinet-makers' hand screw. The ground glass of the camera was removed and a wooden plate was substituted, with a circular 3-inch opening. On this the gelatined glass was laid, and we found a light dusting over with French chalk just imparted translucency enough to make the image nicely visible, and lo! the picture was reproduced with proper reduction, and any deft fingers could trace the lines on the gelatine surface. When dry the French chalk would all rub off and leave the slide transparent.

But even then time threatened to beat us, and necessity bore more invention.

This time a peep hole and another table were tried, minus the camera, and it was found quite easy to trace the lines without the camera and the dark hood over the head which the camera made necessary.

But the nose and other things persisted in being more or less in the way, and necessity was once more invoked to exercise her maternal office.

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This time things were somewhat reversed. Here you have a fair peep hole for the eye in the top of a hollow cone long enough to let the nose hang down out of the way, a rest for the forehead to keep the eye steadily and easily at the peep hole, and a table for the slide without anything to obstruct the hands.

With this simple apparatus any one with reasonably steady nerves and a little skill with the pen, can reproduce cartoons and pictures

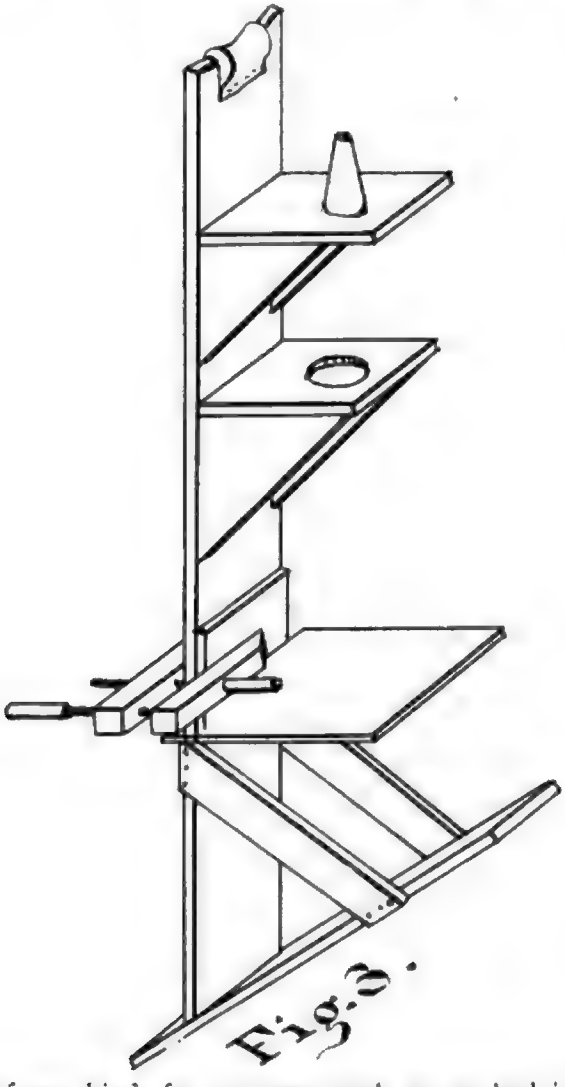


Fig. 3.

of any kind, for purposes such as we had in view, with great rapidity, and aside from the element of time with practically no cost. Of course, artistic skill enhances the result, but for such temporary purposes artistic skill is seldom a necessity, and very generally is unimportant. Any way, our show was a great success. We had, impartially, the laugh on everybody, and when our friends in a neighboring town got wind of it, they sent a messenger every half hour to borrow the pictures as fast as we used them, promising to stand half the expense of their production for the privilege of using them —a promise, by the way, which they kept in the way political promises are usually kept.

When other fingers were enlisted in the work of reproduction our young artist varied and relieved the monotony of the task she had consented to by coloring a lot of them—the means being some aniline inks—red, blue, green, purple—and some oil colors which were found properly transparent, like prussian blue, the lakes, and gamboge. Time did not serve for much experimenting in this line, but we did enough to find abundant reason for anticipating success whenever experiments are made. No doubt our friends, the plate-makers, could tell us just what to do, right off hand. Perhaps to take the colors nicely the gelatine needs to be baked, or bathed in alum, or some other way treated.

I suppose, if coloring is intended, it would be better to make the drawing in some pale color, which would not obscure the after tint as india ink would do. But all that I leave now to younger heads and hands. I am satisfied we did it pretty well last election night.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER II.

(Continued from Page 416.)

Their relative rapidities are as 100: 400 or as 1: 4. That is the lens working at *f*/10 is four times as quick as the lens working at *f*/20.

This holds with all lenses of whatsoever kind. But it must be remembered that working aperture is not necessarily the diameter of the lens-tube, but of the area through which the rays pass, thus fixed stops or introduced diaphragms necessarily diminish the working aperture, but when comparing two lenses in this way full aperture is understood, that is there are no diaphragms introduced. The student will now understand on what the quickness of the lens depends and why the introduction of smaller diaphragms increases the length of exposure, *f*/8 is a quick lens, *f*/6 very quick, and *f*/3 the quickest ordinarily made.

Now the next point is *what size will the image be on our ground-glass.*

Now it is evident that the size of the image depends upon the focal length of the lens and

the distance of the object from the lens. We must remember here that there is one focal plane in a camera where the image is seen sharpest, by wheeling out or wheeling in the camera this sharpness is blurred. Now if a man is focused sharply and he moves *away*, we must follow him by wheeling in to get him sharp, and he gets smaller; and conversely, if he approaches we wheel out to get him on the focal plane and he gets bigger. Now providing we know any two of the factors, *i.e.*, focal length of lens, distance of object from lens, and size of image, the third can easily be found.

Let F be the principal focal length of the lens, D the distance of the object, F_1 the focal length at which the object is sharp. Then

$$\frac{1}{F} = \frac{1}{F_1} + \frac{1}{D}.$$

e.g. Take a lens of 20 inches equivalent focus and suppose the foreground or nearest object we require to be sharp to be between 60 and 70 feet, say 800 inches; we have

$$\frac{1}{20} = \frac{1}{F_1} + \frac{1}{800},$$

$$39\ F_1 = 800 \text{ or } F_1 = 20{\cdot}51.$$

So that the camera must be wheeled out half an inch beyond the position for parallel rays in order that the object be sharp; and the size of the image will be $\frac{1}{40}$th of that of the object, actually as 20.51 to 800.

Referring to our figure illustrating conjugate foci, we may state, for all practical needs, the object being distant 40 times the focus, the image will be $\frac{1}{40}$ of the focus beyond the focus for parallel rays, $\frac{1}{40}$ or half an inch.

If we wish, therefore, to get an image of a certain size, with a certain lens, we can determine how far off to place that object to get our desired size. Mr. Sécrétan, however, has worked out a series of most useful tables which are published.

Now for the time I wish my readers to regard all photographic lenses ever made as being exactly like one another, except in the matter of focal lengths and angles of view included, and when we regard the *size of images* and amount of view taken in, all lenses may be considered on these points as only quantitatively different. Now it is perfectly obvious that the narrower the angle of view included in the picture the longer the focal length. Therefore, the question arises within what angle must we work. Perspective has clearly shown that we get better and more pleasing views of objects if we draw them from a point distant twice the distance of the greatest diameter. Now if we get off to that distance we shall find it advisable to use what are called long-focus lenses, and these necessarily include a small angle of view.

Perspective and experience show that the best working rule for choosing the focal length of the lens is to select one twice the base length of a picture as nearly as can be though a focal length of the diagonal of the picture is safe. It will thus be evident that if you use a wide-angle lens a *part* of the picture will be in true perspective; and if you take a picture with a lens of 20 inches focal length, and one with a lens of 12 inch focal length, there will be a part of the picture in this which can be enlarged so as to give exactly the same picture as the 20 inch focal length picture. Now the great advantage to the novice to be derived from the use of lenses of long focus is that he cannot so ignorantly employ them as he can the wide-angle lenses. Then it will be asked, "what is the use of these wide-angle lenses?" These lenses were made for people (not artists) who wished to embrace the whole of nature in their photographs, and they were *made to include* large angles of view, not to be correctly employed for using portions of the picture only. When a view is taken with a wide-angle lens close up, as is usual, the resulting photograph is artistically false, and these lenses give false drawing thus, for we must look at the complete result, and not cut out that portion of the picture which is in good perspective. The near objects are relatively out of proportion; the eye cannot take in a wide angle of view such as these without straining itself terribly, which is not *looking* at a thing. We shall be told that if we place the eye at the distance of the focal length that the perspective will be true. It will be true for the small portion we can see, but not for the parts that we have to strain our sight to include.*

Let anyone take a large building with a short focus lens and then place his eye at the distance of the focus, he will see, not the building, but a few *sharp* windows, with modeling and tone such as he never saw in nature. Putting the eye at the distance of the focal length is the best point of sight when the picture has been taken in true perspective. This may be said to hold of all pictures.

* We may state that the drawing given by the lens is the same as with a pin-hole similarly disposed to the plate, the drawing being in *theoretical mathematical perspective*, and may convince some who would "strain at a gnat," that they see the whole picture as they would view the object.

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It will be seen from what I have said, that the wide angle lenses can give true perspective for certain portions of their picture if correctly used, but that is no gain, and their use in ignorant hands is so dangerous and their other bad qualities so truthful, that I have no hesitation in condemning them for artistic work. The focal length of the lens then should be as a working rule, twice the length of the base of the picture, that will meet the case. A lens should never include more than 40 deg.

Apart from what may be called false perspective lenses (which they are if *used* for the purpose for which they are made), for it cannot too often be repeated that they are never made for the purpose of using them so they would be pictorially long focus lenses, *i.e.*, when portions of the picture are correct in perspective; there are certain *single* lenses that distort objects. Now the shorter the focus of a lens (the diameter remaining the same), the greater is the distortion. By using a diaphragm this distortion varies, for if the diaphragm be brought right up close to the optical center of the lens, its center only is free, there is no distortion, but if it be moved away from the lens, distortion follows within certain limits, for if moved towards the lens we get barrel-shaped distortion or a bulging of the sides of a square. By moving the diaphragm behind the lens towards the ground-glass we should get pin-cushion distortion or the opposite kind of bulging. This distortion is overcome say in a rapid rectilinear lens by uniting two objectives and placing the diaphragm in the middle; in short the lenses neutralize each other.

Now all single lenses have this distortion more or less; it is not perfectly corrected, it cannot be, so that is another point against them. Of course, if a large aperture single lens be employed and the picture only taken with the central or more parallel rays, this distortion is almost inappreciable, but as we have said it is there, and the more of the lens is used the more distortion must you get. We have hitherto supposed all lenses to be theoretically alike for simplicity's sake, and every lens to possess the same qualities.

From this short study we have arrived at the fact that for naturalistic photography narrow angles, long focal lengths and rectilinear lenses must be used.

But there are many other qualities possessed by different lenses that we must discuss and weigh in the balance, and altogether try and find out what are the best all round lenses, so that we may give as true a visual impression of nature as possible.

This leads us to consider peculiarities in lenses called aberrations. If we return to the pin-hole camera we remember that as we increase the size of the aperture beyond a certain size the image becomes blurred. Now as our single lens gets bigger the marginal and central rays do not come to a focus on the focal plane at one and the same time. This is called spherical aberration because it results from the *sphericity* of the lens.

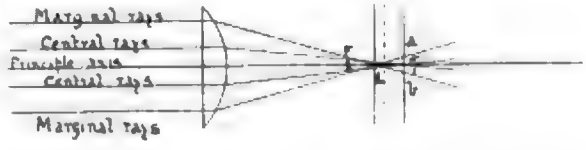
The other aberrations which we shall discuss as we proceed are chromatic aberration, curvature of the field, distortion, astigmatism, and lens reflection.

Now a lens with spherical aberration gives a halo to the image, the halo constitutes lateral spherical aberration.

To illustrate:

Figure VII illustrates the passage of marginal and central rays through an uncorrected

Fig VII



lens, the marginal rays come to a focus at *f*/2, considerably nearer the lens than the focus of the central rays which takes place at *f*/1, the distance between *f*/1 and *f*/2 is what is termed the longitudinal aberration, the transverse aberration is shown at A B. This occurs as an outstanding halo round the best focus possible, viz., at *f*/1. Between *f*/1 and *f*/2 there is a portion L, known as the least circle of aberration, and is the smallest section it is possible to make —the cone of rays convergent from the lens. The measure of a spherical aberration is greater or less according to the curves assigned to a glass lens constructed to produce a given focus. Practically an infinite number of curves may be ascribed to give the same focus, all differ in the amount of longitudinal and transverse spherical aberration. Using glass of refractive index 1.5 the "crossed" lens in which the curvatures of the radii are as 1 to 6 will have the least aberration and a deep meniscus the most. Referring to the lens as shown in Fig. VII the aberration given by this is nearly four times greater than if the parallel rays were re-

ceived upon the convex surface, or in the words if the lens had been reversed.

The student would do well to examine this aberration practically by focusing a lamp flame with the full aperture of an uncorrected lens, it is most visible with lens of short foci, relatively to their diameter. If we utilize only the central rays, and this is readily done by using a diaphragm, we shall be able to nearly destroy the outstanding aberration when the aperture is reduced to about *f*/15.

Spherical aberration is destroyed completely by combining a negative lens with the convergent lens. Such a lens is termed aplanatic. In lens making, however, it is necessary not only to cure the spherical aberration but the chromatic aberration also, the latter must always be considered of primary importance in a well corrected lens. The form given to a lens will be determined by the purpose for which it is intended, such as, proper correction, of flatness of field, equality of illumination, freedom from marginal astigmatism, etc., so that it frequently happens that spherical aberration cannot be completely cured, sometimes the effects of correction are to leave outstanding possible spherical aberration, when a lens is said to be under-corrected. Ocasionally negative spherical aberration is found outstanding when the lens is said to be over-corrected; in this latter case the marginal rays have a longer focus than the central rays. We should mention here that this positive spherical aberration is occasionally purposely left outstanding in lenses to give a *softness* to the picture. Single lenses are invariable supplied with a fixed stop ranging between *f*/10 to *f*/16, and at their apertures the aberration is eliminated, if larger apertures are worked with, then the spherical aberration will assert itself. There is another defect noticeable in single lenses, whether corrected or not for spherical aberration.

If we examine a point of light off the axis of the lens it will be found that the central point or areol (if spherical aberration exists) lengthens as the point departs from the principal axis, forming what is technically termed a *coma*, this of course is inadmissible and has to be cured by the aid of the diaphragm, in an uncorrected single lens it requires a stop of about *f*/30, but if a "compound single" combination from *f*/10 to *f*/16.

Delicate optical instruments, like lenses, must, it is needless to say, be carefully protected.

A good lens should be free from scratches, striations, dull patches due to imperfect polishing, and veins; but air bubbles do not affect its value, for it must be remembered that the shape of the hole through which the light passes does not affect the image, save only by cutting off some of the light. Thus, if a wafer be stuck to the center of the lens, the image will be found unimpaired. Dust and dirt, however, though they do not seriously impair the definition of the image, yet cut off much light, as will occur to any one when he thinks of the difference between the light of a room, when the windows are dirty, and when they are perfectly clean. Lenses should not be left in bright sunlight, for this causes a change that slows them, the dark also injures them in certain cases, for, as all microscopists know well, darkness causes a change in Canada balsam, with which lenses are cemented together.

Mr. Dallmeyer insists that lenses should be kept dry and free from sudden changes of temperature, otherwise they may tarnish or sweat, as it is called. Any one who has been troubled with this sweating will never forget it. Our experience is that the best way to keep lenses is in small leather, velvet-lined cases. We generally keep with them a piece of soft chamois leather, or an old silk handkerchief. No compound of any kind should be used to clean lenses; if anything appears to be going wrong with them, they should at once be sent to the maker.

A valuable little tool is a view-meter. The handiest and compactest we have seen is that supplied in telescopic form.

(To be Continued.)



AMSTERDAM BY A. PIERRE



THE FORD BY CARROLL T. TYSON, JR.

INTENSIFICATION AND REDUCTION —A CHAPTER FOR BEGINNERS. BY THE REV. A. H. BLAKE, M.A.

Most prosaic certainly, but very necessary, this afterwork upon the unsatisfactory negative, and how often we require it, I fear, the beginner would blush to own. That face, that child's pinafore, that light on the water, are *so* dense they will not print out at all in reasonable time, and give nothing but white paper with very faint markings, in spite of all our blandishments. Then again, that negative, owing to there being a fluctuating light in the dark-room, has been carried much too far in development, and is almost impenetrable, taking almost as long to print as the fabled negative of the London printer, which he *said* he left out every day for a month during the prevalence of a London peculiar.

This negative, on the other hand, after fixing, was so ghostly a character, that when held up to the light of an ordinary lamp there was some difficulty in determining what it really was intended for, and something must be done if it is to be brought up to anything like printing density.

The two methods by which these faults in negatives may to some extent be remedied are known as intensification and reduction.

First let us give the formula for what is known as mercurial intensification, and explain the *modus operandi*.

We shall require ½ ounce of powdered bichloride of mercury (which should be treated with due respect, as it is very poisonous in its nature), ½ ounce of hydrochloric acid, and a 40 ounce bottle.

Now take the mercury and put it into a vessel containing the hydrochloric acid, and then when dissolved pour the mixture into the 40 ounce bottle filled almost to the top with water.

This solution will keep an indefinite time, and can be used over and over again till its strength is exhausted, as there is no chemical change, but simply exhaustion of its active power.

We shall also require a 10 ounce bottle, in which we put 1 ounce of ammonia ·880, and fill up with water, making what is for practical purposes a 10 per cent. solution

We now take our plate to be intensified and give it a thorough washing to get out of it the last trace of hypo, for the intensification by mercury will show up all the traces of hypo left in the film by staining those portions a rich brown.

After washing, the plate is put into as much of the mercury solution, poured from our stock



ENCOURAGEMENT BY GEO. D. FIRMIN

bottle, as is required to well cover it, and is left there till it is bleached well and shows *pure white* right through the plate.

Again place the negative under the tap and give it a good washing of some quarter-hour duration.

We now pour into our dish some of the 10 per cent. ammonia solution and gently and rapidly slide our plate into it, taking care that there are no markings formed, and, if necessary, gently rubbing its surface with a dab of soft cotton wool.

All that now remains will be to wash again, and the plate will be ready for drying.



PORTRAIT BY R. W. HARRISON

Should the first operation be insufficient to procure the necessary density, it can be repeated till the required amount is obtained.

But turn we now to the opposite process. Our negative, instead of being too thin, is too dense, and we require to reduce that density in order to make a good printing negative of it.

Where before the presence of hypo was a positive danger, here it becomes a necessity, so that if we discover our error we can proceed to reduce our negative as soon as it comes out of the hypo bath, and in truth this is really the best time of all to do it.

Taking the dish necessary to suit the size of plate we use, we put into it sufficient clean hypo solution of the ordinary strength used for fixing, and add a few drops of a 10 per cent. solution of red prussiate of potash, the following being the formula:—Into a 10 ounce bottle with glass stopper place 1 ounce of potassium ferricyanide, and fill up with water; shake till dissolved.

The strength of the reducing solution can, of course, be strengthened if its action be not rapid enough, by adding more of the red prussiate solution, but care must be taken not to get it too strong, or you will soon be left with a plain glass plate and a varnish negative.

But in thus speaking of reduction, we have only dealt with cases where reduction was necessary *all over* the plate; but this is not either the most difficult or the more usual complaint of negatives in this connection.

One part is far to dense in *comparison* with another part; here is a state of things more difficult to deal with.

One method will be to dip the negative as before into the hypo and put a strong solution of hypo and ferricyanide into another little dish and use a camel-hair brush to apply it to the part effected, great care being taken that the reducing solution does not run over the part which does not require weakening, as it will inevitably do unless the negative be repeatedly plunged into the hypo during the process.

At the best of times this is a very risky process, and unless duplicates of the negative be possessed, or very great skill employed, too dangerous to attempt.



SIGNS OF SPRING BY R. E. M. BAIN

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Is there then no other way?

Take a piece of washleather and a little spirit of wine, and dipping the finger covered with the washleather into the spirit of wine, rub the place which is too dense until sufficient reduction takes place. Care is required here, too, not to carry the rubbing process over and beyond the required spot.

Some people have recommended to add a little emery powder on the tip of the finger, and use that as well to rub away the film a little. This also may with care be safely adopted, but careless handling will soon cause the film to be perforated.

With regard to the reducing solution above described, it may be well to remember that when the hypo and the ferricyanide are once mixed they soon deteriorate, and must be used at once, and after use thrown away, as they will not serve a second time. Mistakes and disappointments often occur from the expectation that the old mixed solution will do the work which it cannot do when once decomposition has set in.

The average amount of hypo and ferricyanide should be as sixteen to one, that is, to every 4 ounce of hypo add ½ ounce of the ferricyanide solution.

It may some time be required to use the reducer not so much to thin down density as to remove fog.

This is a very difficult matter, and the cures for fog are far to seek, and many a beginner may well despair of getting rid of his enemy, fog, who seems to dog his footsteps, to lie in wait for him round the dark-room lamp, in the ammonia bottle, through cracks in his dark slides, anywhere, everywhere, in fact, and when once he has *got* there he is hard to oust.

This reducer which we have given may be used to get rid of fog, and Mr. Gamble it is, I believe, who says that the best way to use it for that purpose is to pour it upon the plate from a little distance, making it so to speak, splash on; this will render its action more on the surface of than in the film.

Our best wish for the beginner must necessarily be that he may have such successful negatives as rarely, if ever, to require a reducing or intensifying agent, but when he does he cannot do better than resort to the old-fashioned remedies here set forth, and when in difficulties resort to mercurial intensification to increase the density of his negatives, and the solution of hypo and ferricyanide to thin them down.

We do feel that a word of warning is due to beginners, lest they get into difficulties over these operations and then blame us, and, even at the risk of repetition, we must say again: in order that intensification by this method may be successfully carried out, *perfect washing* of negative is *essential*.

Again, *extreme* care is required to prevent the reducing solution from traveling beyond the required portion, and *frequent* dipping in the hypo is requisite as well as the keeping of the brush well within the outline.—*The Amateur Photographer* (English.)

SHIELDING ENLARGEMENTS.—A CHAPTER FOR BEGINNERS.

BY CECIL M. HEPWORTH.

A GREAT number of reasons have been advanced to prove that a small camera is better than a large one for the use of the average amateur. Many arguments have from time to time been cited to show that he will find it to his advantage to produce small negatives in the first place, and to subsequently make enlargements from those which are deemed worthy. It will hardly be doubted that the strongest of these arguments is that which points out the great facility which this method offers for that "faking" which is so dear to the heart of him who aspires to artistic results. Thanks to the excellent example which has been set before the world of photographers during the last few years, there are very few true amateurs who do not wish to turn out work that shall bear not only the stamp of their own individuality, but should also prove beyond doubt that that individuality is worth the stamping.

In the majority of photographs of this class, "faking" plays a very important part, and by far the most pregnant branch of legitimate fakement is that which has to do with the shielding of certain portions of a picture during the printing of the positive from the original negative. In the case of large negatives from which the print is made direct by contact, this toning down or subduing of certain parts is effected by pasting pieces of semi-transparent material on those portions of the original negative which it is desired should be less deeply printed. This is the most common method, but different workers have their different plans, as in all other branches of the subject, and each

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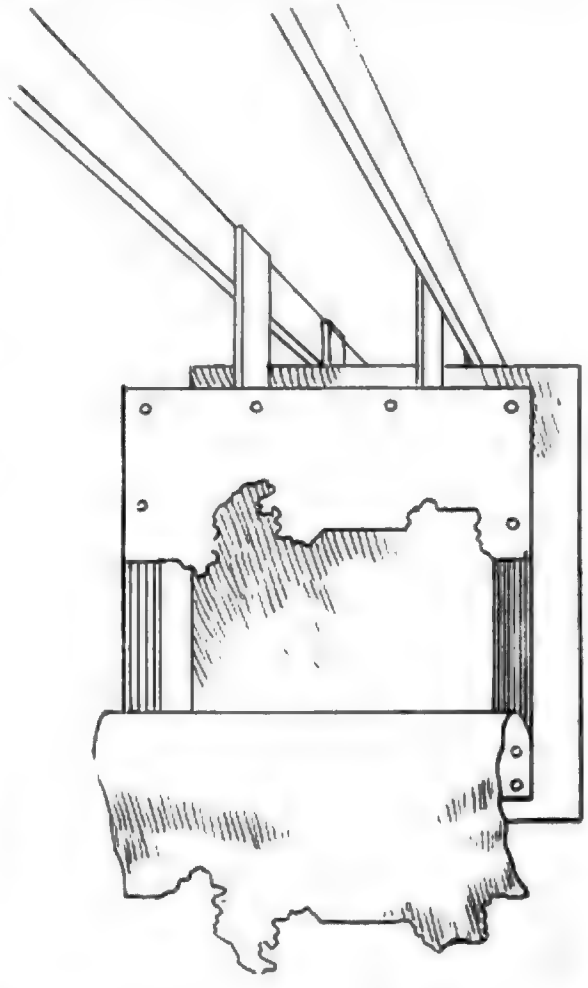
believes his own to be the best. Some cover the whole of the back of the negative with *papier minérale*, and then cut out with a penknife all those parts that do not require the shielding. Others employ a permanent backing of tissue paper on which they paint in yellow or black over the parts they wish to shield, while others again use the paint alone without the paper. In any case the object aimed at is the same, the subduing of certain subordinate portions of the picture so as to bring the more important parts into greater prominence.

It need hardly be pointed out that this power of accentuating the more important constituents of a picture can only be successfully wielded by those who possess the artistic gift, or at least have a fair amount of that guiding knowledge which is the next best thing. With that, however, this article has nothing whatever to do. It is merely necessary to show how this shielding can be applied with even greater ease to enlargements than to contact prints, leaving those who run and read to apply the power for good or, perchance, for evil according to their individual lights.

One of the greatest advantages of faking during the enlarging process, in contra-distinction to that which is accomplished in the course of printing by contact is that there is no necessity to interfere with the original negative in any way. Many workers have a very decided and not at all unnatural objection to painting or penciling on a good negative, even when the modifying process is confined to the back, for faking of this kind—at all events, in the hands of the beginners—is an experimental business, and the results are never certain until they are accomplished. When the modifications of light and shade are to be made during the enlarging process no alterations whatever are made on the negative; the shielding is done entirely by means of a screen or screens placed between the negative and the sheet of bromide paper upon which the picture is projected.

The simplest case of the kind is that in which it is desired to shield the sky portion of a picture the negative of which is too thin to yield the clear white space that is required where clouds have to be subsequently "printed-in." In a case of this description, where the horizon line is fairly straight, it is hardly necessary to have a properly supported shield, for a piece of card held in the hand is all that is requisite. But where the outline is of a more complicated nature it will be found advisable to support the shield in such a manner that it will remain stationary during the entire exposure.

A few weeks ago, under the title of "A Photographer's Overhead Railway," I described my own pet form of mechanical contrivance, whereby the various pieces of apparatus used in enlarging and other kindred operations are held in position and in their proper relation to one another. In this device the lantern, the easel, and all other things required in the en-



larging process are pendent from a couple of overhead rails on which they are free to slide backwards and forwards as may be required, while the optical center of each always remains in the same straight line. Moreover any piece of apparatus can be placed on the rails, or removed from them without interfering with any other. If I describe a vignetting device for use with this contrivance, it will be easily seen how it may be applied to any other arrangement of a similar description.

It consists simply of a rectangular frame of

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wood, the opening in the center being nearly as large as the largest picture which is to be made with its help. The flanges of the frame should be about two inches broad, and it should be made of soft wood, so that paper may be easily attached to it by means of drawing pins. The frame is hung from the overhead rails in the same manner as all other pieces of apparatus, with the center line of the whole system running through the middle of the aperture. Its most generally useful position will be found to be when it is distant from the sheet of bromide paper, or other sensitive surface, by a about one-third of the total distance between that and the lens of the lantern. The simplest way to describe the manner of using the device will be by taking an imaginary case of a negative which requires faking.

We will suppose that the negative is the result of a snap-shot at a landscape subject, and that for some reason that we need not now enter into, the sky portion is unduly thin, and is decorated with unseemly and undesirable flaws. The horizon line is rather rugged in shape, and consists of dark trees in one part which you wish to stand out in marked contrast to the light sky, so that care must be exercised that the shielding of the latter does not overlap them.

The first thing to be done is to take an ordinary contact print from the negative and to carefully study it so as to decide exactly what treatment will cause it to yield the best picture. Having made this decision, with the result that you have a fairly accurate mental impression of the appearance and quality which you wish the finish picture to present, we may proceed to business.

Put the negative in the place provided for it in the enlarging lantern, and focus it carefully on the sheet of white paper that occupies the place on the easel which is afterwards to be filled by the bromide paper on which the enlargement is to be made. Let us suppose that you have decided that the picture will require a slight indication of clouds and that you have a suitable cloud negative all ready to be "printed in." Also that part of the foreground being unduly dense, will require a longer exposure than the rest of the view in order to bring out some necessary detail, while a hill in the distance is rather too prominent on the trial print and will be all the better for a little more atmosphere, which can be easily introduced.

Having found that the image cast upon the screen is of the right size and well focused, draw the wooden frame into position a few inches in front of the easel, and stretch a sheet of brown paper over it with drawing pins. With a pair of scissors divide the paper all along the horizon line, and let the lower portion hang down out of the way, until it is required for future use. So much for the sky shield.

Now hang a second sheet of brown paper over the first by means of a couple of bonnet pins, and cut out with scissors, as before, all that portion which represents the piece of dense foreground that requires longer printing than the rest of the picture. Have a jagged piece of brown paper handy for shielding that mountain that wants more atmosphere, and then the lens may be covered, and the bromide paper pinned up in position on its easel.

First expose that bit of foreground for a length of time which is judged sufficient, when added to the further exposure it will get with the rest of the picture, to bring out the details to the required extent. Then deftly remove the two bonnet pins, and take the first shield out of the way. Now, when the whole of the landscape is receiving its exposure, is the time for the introduction of the bit of "atmosphere" in front of the distant mountain, and you do it by holding the jagged piece of brown paper over the portion to be affected for a sufficient length of time, keeping the shield moving all the time it is interposed, and at a considerable distance from the sensitive surface, so that they shall be no sharp outline to the shaded portion. When the exposure of the landscape part of the picture is complete, the lens should be covered with a piece of red glass to prevent actinic light from reaching the bromide paper, while enough of harmless light passes through to enable you to make the further necessary adjustments.

These consist of two operations: First, fold up into position again the flap of brown paper that was discarded for the time being when the sky shield was cut out. See that it meets the edge of the paper from which it was separated, pin it in position, and remove the upper shield, which is now no longer required. Secondly, replace the landscape negative in the lantern with the cloud picture that has been selected as suitable to the subject, and all is ready for the second exposure. This should, of course, be of short duration, but the question of its length need not be here entered into.

Enough has now been said to show the prin-

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ciple of "printing-in" as applied to enlargements; and the working out of suitable schemes for different classes of pictures with their different requirements, must, of course, be left to the judgment of the worker.—*The Amateur Photographer* (English).



A TRAVELLING DAGUERREOTYPER.

HELIOGRAPHY AS A PIONEER OF MODERN CIVILIZATION.

BY JULIUS F. SACHSE.

(Translated from the German in Eder's Jahr Buch for 1897.)

Few persons ever take into consideration what a great factor the Heliographer has been in the spread of civilization in all parts of the world.

Upon the western continent, the camera and sensitive plate for the past half century, has ever been one of the most active pioneers in the advancement of the great American Republic.

If we look back into the history of the outlying settlements, during the early 40's, and which then did not extend so far beyond the Ohio, we find that in most places, long before any local printing press was established, the itinerant daguerreotyper, with camera, buff wheel and fuming box, had made his advent, and established a regular circuit from town to town, extending his limits as new settlements were projected. He was but a prototype of the ferrotyper of the present day, who, with his portable studio, moves from camp to camp in the mining country, and is to be found in the wildest sections of the "Rockies." Nor does the itinerant photographer of to-day confine himself to this continent where he is largely represented in the wake of traveling circus or resorts for health or pleasure but even in cultured Europe he is occasionally met with. A case in point in the writer's experience, was during the summer of 1894, where a typical representative of the American ferrotype faker was met on the mountain top of at Oberhoff, in the fastness of the "Wilde Gera." Here he had squatted upon a lot just beyond the Kursaal enclosure—van, tent and all. The sign upon his traveling studio set forth that "Permanent portraits, could here be had according to the American system upon sheet iron (*eisen blech*)."

In early days the itinerant daguerreotyper, photographer, or tintyper, call him what you may, was ever an advance herald of the coming civilization, no obstacles were too great for him to surmount, no river too swift, no hill or mountain too steep or rugged for him to surmount, no prairie too trackless; wherever any pioneer settlement was formed, there was to be found the ubiquitous heliographer, often long before the town, camp, or digging boasted of church or preacher, or had evolved itself from the state of frontier lawlessness and mob-rule into a law abiding community.

In many of these frontier towns or mining camps, where the gambling-hell, the saloon, and

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pistol were the ruling factors, and the only justice dispensed, was of the kind administered by Judge Lynch, the first dawn or sign of order and modern civilization, was the advent of the humble heliographer with his unpretentious car, which served him as house, home, studio and laboratory all in one. This installation, a harmless one, with its few and crude accessories, was frequently set up in the very midst of a lawless camp. The operator, however, remained safe and unmolested, where a missionary or preacher could not have remained for a day.

There always appeared to be a feeling of kinship between the sturdy pioneer and the itinerating heliographer, which in the case of the lawless element changed to one of respect; and there are few cases upon record where one of these traveling "artists" was molested.

The illustration accompanying this paper, is a copy of an old daguerreotype, taken about 1847. It shows one of these traveling daguerreotype vans, which had been put on a rude flat boat upon one of the tributaries of the Ohio river. After it was loaded, a lad, an apprentice to the operator, daguerreotyped it from the shore seen in the foreground. This picture remained in possession of the operator until a few years ago when he, in his old age, gave it and its history to the writer.

The wandering and peripatetic heliographer is frequently made the butt of his more aristocratic brother of the studio, yet it remains a question whether the regular studio "artist" ever filled any mission in the interest of civilization, akin to his humble brother with traveling van and outfit. What refers to America, also is the case in Asia and Africa. Wherever colonial possessions are held and permanent settlements are attempted, the itinerant photographer follows in the wake of the adventurer and explorer, a true pioneer of modern civilization.

SMALL *V.* LARGE NEGATIVES.

BY JOHN H. GEAR, F. R. P. S.

By far the greater number of amateur photographers are the possessors of apparatus of a small or medium size, and amongst whom there is a perpetual discontent, a feeling they are seriously handicapped against their more fortunate contemporaries who follow the dictum of every ambitious fancy. Not only with those who are perhaps unable to conscientiously expend the requisite amount, but it does exist, I know, with those in a position to lay out £50 or more upon 12 by 10, or 15 by 12 size apparatus, but who are restrained by economical wisdom. Nevertheless they are none the more satisfied, they are not actually *hors de combat* with their lucky photographic *confrere*. I would endeavor to allay the feeling of such an one by reminding him of the attendant cost of working the large size plates beyond the initial outlay, the enhanced expenses incurred in getting about the country miles from railways, and sometimes almost impossibilities, the limitations there are in working large plates against small, and numerous other disadvantages. I am perfectly cognizant of the great pleasure in composing the picture upon a large focusing screen as compared with the quarter-plate screen, also in finishing the large negative direct with about as much ease in the manipulations involved as with the small size; withal, the advantages of the small camera for the average artistic landscape workers are not outweighed. For commercial photography it is a very different matter; professional men must be prepared to meet the requirements of their customers as expeditiously as possible, the time involved being one of his greatest considerations, he must therefore have apparatus suitable for his work, which will not allow either of the broader treatment it is sometimes necessary to give when making prints from enlarged negatives of great amplification. It is not to the photographer when engaged in his commercial pursuits I am addressing these remarks.

By way of offering a little consolation I would ask the uneasy one to reflect for a moment, and if he has time, to try and arrive at the approximate difference in the amount of his expenditure in plates, if he had been using, say 12 by 10 plates, costing 1s. 4d. *each*, instead of 1s. 6d. per dozen. In attempting this do not cast your eye over a few piles of the successful negative only, but be candid and admit the dust heap can lay claim to many more. Your retort—a very reasonable one too—will be "I should have been more careful with large plates." In that case, my quarter-plate friend, your experience would doubtless lack more than it does under the circumstances. Further, it must not be overlooked that small photographic gems would not necessarily be priceless jewels if they were of much greater area.

If then it should be our assumed misfortune

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to be the owner of a modest quarter-plate camera only, or should it be our lot to have obtained but a quarter-plate negative of an excellent subject, instead of making captious objections, why not make an enlarged negative, the *modus operandi* being about as simple as any other photographic operation to which careful attention is devoted?

Should the negative have a defect, or should it be desirable to get rid of an obtrusive detail, retouching can be applied with marked effect, as having a transparency next to deal with, anything overdone upon the negative can be corrected with ease. Great facilities for strengthening shadows are offered by the transparency, thereby reducing to a minimum work upon the finished print. If a landscape or other subject requiring the combination of clouds, they should be secured upon the transparency, in which case I strongly recommend the transparency to be made by contact in preference to making an enlarged one. Upon a small positive, the retouching needs being very carefully done, I admit, but it is infinitely easier to make a good combination by contact than enlarging in the camera; by the latter method the cost is greatly increased and the chances are the resulting negative may not be so successful, because in the quality of the transparency lies the secret to success. Two or three can be made by contact expeditiously and cheaply, the best



THE OLD LYCH GATE BY ALEX. KEIGHLEY



PORTRAIT BY J. WELLS CHAMPNEY

of them taken, whereas one is apt to hesitate to make another if it has to be enlarged in the camera, if the quality of the one obtained is only passable.

For the transparency use a good slow dry plate which has the least grain. It must possess all the tones of the original negative, but the ratio of gradation in a much closer scale than in a transparency for viewing as a finished result. The deepest shadows should be of no great density, and the high lights showing very little, if any, clear glass.

The apparatus necessary to turn out the best results need but be of the simplest character; one essential, it must be absolutely free from vibration. The lens with which the negative was taken will answer every purpose if it will cover the plate and give good definition at a fairly large aperture. A double dark slide to take the largest plate to which it is intended to enlarge and an easel to carry the slide are all that is required, assuming that the camera is of such a form as will carry the transparency and rack from the front for focusing. The dark slide can be dispensed with if the dark room is conveniently appointed, the plate merely being fastened up with drawing pins; but, personally, I prefer to have large plates in a slide, and protected as much as possible. If the plate has to be taken from enlarging room and developed elsewhere the slide will be found the safest and most convenient. If a spoilt negative is covered with white paper and placed in one side of the plate-holder, focusing can be performed with a

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certainty, the plate-holder being simply turned over and shutter withdrawn to make the exposure. The side containing the sensitive plate should be boldly marked to reduce the chance of accidentally exposing instead of the focusing screen to one of gross carelessness. The room must obviously be perfectly free from all actinic light excepting that emitted through the negative and lens. Even illumination of the negative must be secured by a reflector at an angle of 45 deg. upon the outside.

A plate of ordinary rapidity should be selected; quarter-plates of the same batch emulsion for test exposures can always be obtained from the manufacturers.

If more or less diffusion of focus is required, my advice is, obtain it in printing instead of suppressing the definition in the negative; by this means the resulting grain is got rid of—in fact, the grain is often of assistance in preventing bronzing of the shadows, especially if the picture has received broad treatment.

When making an enlarged negative advantage should be taken of the possibility of correcting distortion should it exist in the small negative by reason of the swing-back not having been placed parallel with the vertical lines of the subject.—*Amateur Photographer (English)*.

A MINIATURE—WHAT DOES IT EXPRESS? BY G. S. SOUTHWORTH.

In the wide range of art what does miniature-painting represent? There is one word *minutia*, multiform as it may seem; yet in getting down to detail, no form of portraiture has called for higher effort or more subtle artistic skill than this difficult, delicate and wonderful branch of portraiture. And as to authorities we may mention J. Staples Rowe, and I. A. Josephi. Mr. Rowe as a high authority on this—one of the reviving arts of long ago—said recently miniature-painting wears out the optic nerve.

"Do you find that the camera does you any good?"

"No! I refuse to use the camera!"

Spoken to again, Mr. Rowe said, "I prepare my ivory in my own way"—and seemingly possessed of an elaborate secret retired into reticence.

Mr. Josephi was a little more candid. He said, during the passages of a studio conversation, that he did not owe anything to photography. This in brief and measured terms was what he said:—

"Ninety per cent. of those who paint miniature use photographs. Artists high in our profession do not. We consider the mere realism of the photograph degrading to the imagintion which is essential to an artistic conception.

It is needless to say that eminent artists, whose artistic skill and feeling have made them prominent in the world of Art, are a little off on the relation of high lights to low shadows.

Photography does not deprive the human mind of any gift or intellectual propensity; on the contrary it is of vast assistance. Nor should it be treated lightly by those who employ the length and breadth of what as a discovery, all considered, has been the greatest boon to the modern world; and the future of which no one can foresee.

Miniatures are what?

The art consists of *Reduction*. That is all there is to it; and there is no more powerful agent than photography to accomplish this result whether for the Living or the Dead.

Photography has, will, and always must continue to have a potent influence on art—whatever branch may be considered. The feeblings may wake up to another conclusion; but those with Argus-eyes see beyond.



PHOTO BY BYRON V. TOMPKINS
BRONZE OWNED BY ALEX. CALDWELL

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THE ART OF MOVING PHOTOGRAPHY.

THE art of moving photography had its origin, or, to speak more strictly, its first suggestion, in that ingenious little toy known as the zoetrope, which enjoyed such great popularity some thirty or forty years ago. This, it will be remembered, consisted of card board-cylinder about a foot in diameter, which was rotated on a vertical axis and contained a series of vertical slots cut in its periphery. A strip of paper, on which were printed a series of moving figures, each one in a different position from its predecessor, was coiled around the inside of the cylinder just below the line of slots or peep holes, the distance between the figures being equal to the distance between the slots. As the cylinder was rotated, the figures appeared to be in motion. The illusion is explained by the fact that the eye is capable of receiving and recording only a given number of impressions in a given time, and if the successive pictures are presented to the eye too fast for their individual apprehension, they will blend, as it were, and produce on the mind the impression of a single picture.

The zoetrope had its day, and ultimately passed out of favor; but its very crude and imperfect moving pictures were full of suggestiveness. The optical laws by which the results were obtained in course of time attracted the attention of experimentalists in the then youthful art of photography. About ten years ago the French scientist Marey, while at work on a flying machine, obtained photographs of birds in motion by means of a number of cameras, whose shutters were operated by the wings of the birds as they flew across the room. The idea was then taken up and further developed by Dr. Muybridge, of Philadelphia. At an earlier day than this Mr.

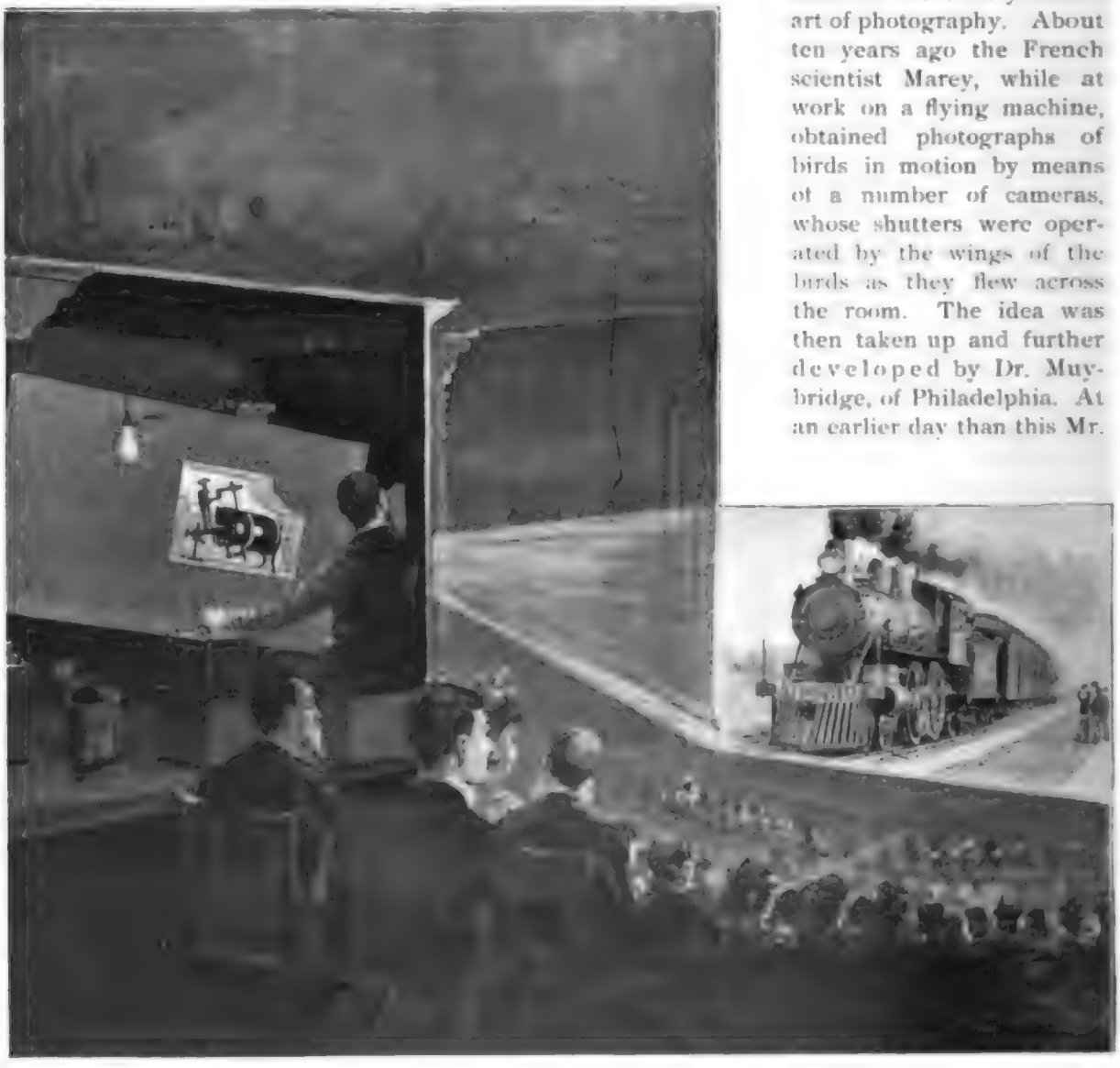


FIG. 1.—THE BIOGRAPH AT WORK IN A NEW YORK THEATRE.

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FIG. 2.—THE DARK ROOM AND REEL FOR DEVELOPING FILMS.

W. K. L. Dickson had been experimenting in the same field, and as the result of the subsequent joint labors of himself and Mr. Edison the famous Edison vitascope was produced. The Lumière Brothers, a firm of French photographers, brought out the cinematograph in 1894, and this was succeeded shortly afterwards by the biograph, which last device, and the "mutograph" and "mutoscope," are the inventions of Mr. Herman Casler and form the subject of the present article.

The machine, with which the original pictures are taken, is shown in figure 4. It is known as the "mutograph," nearly following the Latin and Greek words signifying "changing delineation" The camera frame is mounted by means of three adjustable legs upon a triangular turntable which may be placed upon any suitable support. Upon the top of the frame is bolted a two horse power electric motor, which is driven by a set of storage batteries, that will be noticed standing at the side of the machine. The combination of the turntable with the vertical adjustment before mentioned enables the camera to be shifted so as to take in the required field. In the front end of the camera is fixed a particularly perfect lens capable of gathering a great flood of light and producing an image of exceedingly clear detail. Above this lens on the front face of the camera is fixed a photographic "finder," which gives the same sized image as the main lens, and enables the operator to determine when the subject is properly focused. Inside the camera is a strip of gelatine film 2¾ inches wide and usually about 160 feet in length, which is wound upon a small pulley or drum. The length of the film varies for different subjects, and in the case of a prolonged scene, it may extend to several thousands of feet.

The film is led through a series of rollers and caused to pass directly behind the main lens of the camera, and finally is wound upon a second drum. The object of the rollers is to cause the film to pass behind the lens with an intermittent instead of a continuous motion. At ordinary speeds this would seem to be a matter of simple accomplishment; but when we remember that impressions are taken at the rate of forty a second, and that the film which is run-



FIG. 3.—INTERIOR OF THE "MUTOSCOPE."

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ONE OF A SERIES OF "MUTOGRAPH" PICTURES, TAKEN AT THE RATE OF FORTY PER SECOND.

ning at the rate of from 7 to 8 feet a second, has to be stopped and started with equal frequency, it can be understood that the problem was no easy one to solve. The film comes to a rest as the shutter opens, a phase or image is deposited, and the film starts again as the shutter closes. The impressions vary in actual exposure between one hundredth and one four-hundredth of a second. While the ordinary speed is forty a second, the mutoscope can take equally good pictures at the rate of one hundred per second if it is necessary. The higher speed would be used in photographing the flight of a projectile, or any object that was in extremely rapid motion.

The mechanism within the cabinet is driven by belting from the motor above mentioned, and the speed of the motor is controlled with great nicety by means of a resistance box which is shown in our engraving, Fig. 4, mounted upon the storage batteries. The apparatus is here represented in the act of photographing the celebrated "Pennsylvania Limited" while it was running at the rate of about sixty miles an hour. The mutograph is set up at the side of the tracks upon a solid platform; the stretch of track is properly focused by the operator, and at the moment that the train comes into sight the current is turned on, the speed being regulated through the resistance box, as explained. By the time the last car of the train has flashed by, 160 feet of film has streamed past the lens, received its one thousand impressions and been wound with its precious record upon the receiving spool.

After the mutograph has done its work upon the films, they are carefully packed and sent to the New York establishment of the American Mutoscope Company. Here they are taken to the dark room, the interior of which is shown in the accompanying engraving. Ranged along each side of this room is a series of troughs above which are suspended large skeleton reels, 3 feet in diameter by 7 feet in length, the axis of the reels being journaled in brackets attached to the ends of the troughs. The films are wound upon the reels and subjected to the action of the various solutions for developing, fixing, etc., with which the troughs are filled, the reels being transferred from bath to bath until the films are ready to go to the drying room. In this same department are prepared the positive



"MUTOGRAPH" PICTURES OF CLAY PIGEON SHOOTING AND OF THE FIRING OF A TEN INCH DISAPPEARING GUN AT SANDY HOOK.

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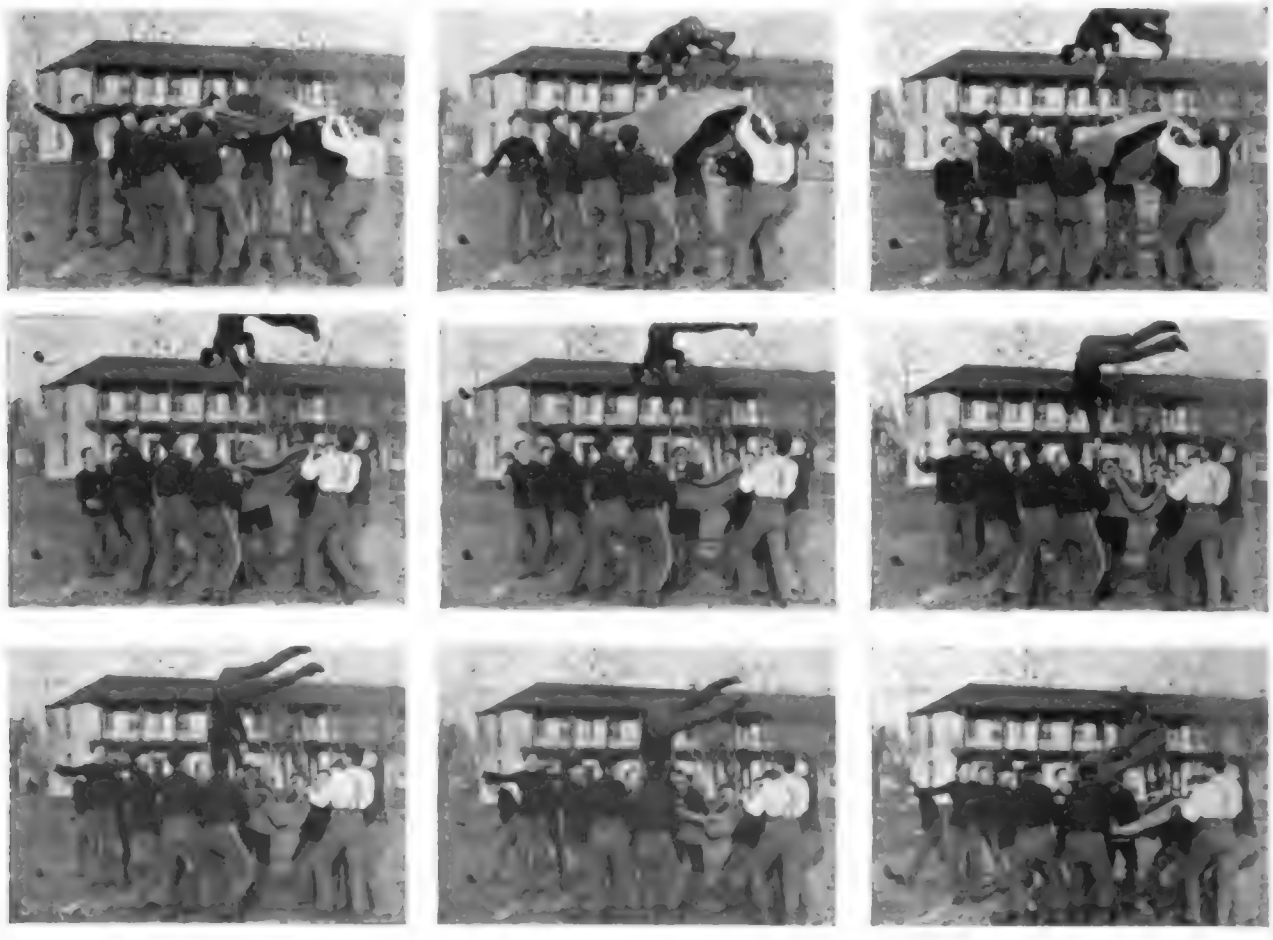
FIG. 4.—THE "MUTOGRAPH" PHOTOGRAPHING THE PENNSYLVANIA LIMITED WHEN RUNNING AT THE RATE OF SIXTY MILES AN HOUR.

PHOTOGRAPHY AS AN ADJUNCT TO THEATRICAL REPRESENTATION.

transparent strips for use in the biograph, and the bromide prints for the mutoscope, as will be explained later in the present article.

The reels are then carried to the drying room, Fig. 5, where the films are unwound on to large wooden drums, of about the same size as the reels, where they are carefully dried. At the far end of the room are seen the machines for cutting up the bromide prints, and here also is carried on the work of retouching the films and prints and preparing them for use in the biograph and mutoscope machines.

The biograph (or life delineator), Fig. 2, is similar in its general appearance and construction to the mutograph. There is a similar arrangement of rollers and mechanism for controlling the movement of the film, and the machine is driven, as before, by an electric motor and controlled by a resistance box, which in the engraving is shown to the left of the operator. The chief difference observable in the interior of the biograph, as compared with the mutograph, is that the former contains a hand regulating arc lamp of 5,000 candle power, which is placed behind the lens. When a subject is to be thrown upon the screen, a spool containing the positive film is placed in the cabinet and run with an intermittent motion through the controlling rollers, down between the lamp and the lens, and finally wound upon a receiving spool. In order to insure that the best effect shall be secured it is necessary to run the film at the same speed at which it was taken—a result which is obtained by the use of a tachometer. The engraving shows the biograph at work in a New York theatre. The whole apparatus and the operator are enclosed in a cabinet which is located at the back of the balcony. A hole is cut in the cabinet for the lens, and there is a window for the operator. The pictures are thrown upon a large screen upon the stage, and the subject which is represented in the engraving, an express train running at sixty miles an hour, is one of the most vivid representations of the kind ever attempted. The audience sees the clouds of steam, the whir-



"MUTOGRAPH" PICTURES OF A BLANKET COURT MARTIAL AT GOVERNOR'S ISLAND.

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FIG. 5.—DRYING AND RETOUCHING ROOM; "MUTOSCOPE" SHOWN IN THE FOREGROUND.

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FIG. 6.—MOVABLE STAGE FOR PHOTOGRAPHING SCENES WITH THE "MUTOGRAPH."

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ring driving wheels, the splashing of the water in the track tank as the engine takes in its supply, the passengers waving handkerchiefs and the workmen swinging their hats as the train goes by, and then the vacant track, all of which is represented with a clearness of detail that is truly remarkable. The excellence of the results is due very largely to the relatively great size of the original negatives, which measure 2¼ by 2¾ inches, and are, therefore, very much larger than anything that has ever been taken in this class of photography.

Perhaps the most novel of the three machines is the mutoscope, Fig. 3, which, on account of its compactness, simplicity of operation, and the large size of its pictures, is certain to win great popularity. In this machine the bulk, the complicated mechanism, and the motor of the biograph are replaced by a simple, box-like apparatus, no larger than the cover of a sewing machine. The enlarged pictures, 6 by 4 inches in height, are mounted in close consecutive order around a cylinder, and stand out like the leaves of a book, as shown in the illustration. In the operation of the mutoscope the spectator has the performance entirely under his own control by turning a crank which is placed conveniently to hand. He may make the operation as quick or as slow as fancy dictates, or he may maintain the normal speed at which the original performance took place, and if desired he can stop the machine at any particular picture and inspect it at leisure. Each picture is momentarily held in front of the lens by the action of a stop attached to the root of the box, which allows the pictures to slip by in much the same way as the thumb is used upon the leaves of a book.

The capacity of the mutoscope is coequal with the camera. It reproduces in motion anything which can be photographed, whether motion of human bodies or movements in mechanism or nature. Thus the Falls of Niagara, conflagrations, moving trains, animals in action, athletic games and sports, scenes from plays introducing prominent actors in favorite roles; in fact, any scene can be reproduced with perfect fidelity to nature and with the actual movements represented by the scene depicted in a most realistic way. Important events in public or private life can be perpetuated, such as parades, military, civic, etc., preserving for years to come the movements and gestures precisely as the scene occurred at the time of its recording by the camera, although some or all the participants in the scene may have long since departed.

Upon the roof of the New York establishment of the company there has been erected a large movable stage for taking photographs of celebrated scenes from plays or of individual performances in which it is desired to reproduce the motions as well as the features of the subject. The details of the structure can be clearly made out in engraving No. 6. It consists of a floor of steel I beams which carries a series of three concentric steel tracks. Upon this rotates a massive frame, at one end of which is a stage supplied with the necessary scenery, and at the other end a corrugated iron house in which is located the mutograph. The stage is bolted to the frame, but the house travels upon a track and may be moved to or from the stage as required. The frame carrying the stage and house rotates about the smaller circular track located beneath the house, and may be swung around so as to throw the light full upon the stage at any hour of the day.

Our thanks are due to Mr. Herman Casler, the inventor of the above described apparatus, and to Mr. W. K. L. Dickson, the pioneer investigator in the art of moving photography, for courtesies extended.—*Scientific American.*



BABY'S PAP BY CARL WOLFF

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SOME RANDOM NOTES. BY MILAN P. WARNER.

Use large focussing cloth about 4 feet square. Never talk to the photograph-man when his head is under the cloth.

Never untie the plate-holder loops; slip them off and on.

To take silvered albumen paper off the solution (when floated for a sufficient length of time) in tray 19 x 23 (rubber or glass), use slat 20 inches long, with a rigid clip at each end.

A few hanging a while by screw hooks on horizontal line, wipe silver solution from lower edge; then hang on another slat with clips to keep from curling.

We want to know the full range or scope of a manufacturer's products.

UNIVERSAL SENSITOMETER SCALE.

(For Everybody).

7.	Super-Sensitive
6.	Quick.
5.	Rapid.
4	Medium
3.	Slow.
2	Very Slow.
1	

It would seem as if the idea of putting this scale on every box of dry-plates made would impress itself on the mind of every manufacturer.

It is of the very greatest importance to the user of plates.

Sometimes a person has to use a new brand; packed lamp with red glass chimney and globe shade is best for changing plates. Portable lamp should be glass, so that oil can be seen, or may be of brass.

After an experience of twenty years as an outdoor photographer I wish to make this point.

The 9 x 11 inch dry-plates is the best size, and should be adopted by the United States Government.

The reversible back, back focus camera, with long extension of bellows, and high sliding front, with individual carrier for holding the plate-holder in place is the best in the world.

Head cloth should be waterproof cloth or velveteen; not rubber cloth.

Gray is good color.

Pyro and potash developer is best.

No. 1.

Water	12 ounces
Sulphuric acid	1 dram
Pyro acid	1 ounce

No. 2.

Sulphite soda	5 ounces
Carbonate potash	4 ounces
Water	24 ounces

For use take

Water	10 ounces
No. 1	4 drams
No. 2	5 drams

Papier-maché trays

For plate 10 x 12 (or 9 x 11) feed in more alkali if necessary.

N. B.—Potash is the best alkali. Use no sal-soda for outdoor work. Use no ammonia in warm weather.

Combined baths are an invention of the devil; not philosophic; will not work to advantage.

Soaking the hands in cold poison is not the thing to do.

Every photographer should mix or dissolve his chemicals himself; know what he is using.

If bought at a drug store the name and weight should be marked on every package.

Let chemicals have plenty of time to dissolve in cold water.

Toning bath and saturated solution of bicarbonate of soda should stand.

In making calculations always consider 480 grains to be one ounce.

The revolving back—back focus with individual camera to hold screen firmly forward against plate-holder, has no equal for field work.

Sheets of silvered albumen paper (white) 18 x 22 inches, quartered, cover the negative plate.

Enameled bromide gelatine paper gives best detail in views.

Rough or mat surface paper is more suitable for portrait work.

Plate-holder slides should be held in place by loops and bands of tape or ribbon.

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MID-DAY

BY H. P. ROBINSON

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EDITORIAL NOTES

Owing to an unavoidable circumstance we were only able to give 8 pages of the Encyclopædic Dictionary of Photography in our last issue. Our readers will find that we have made up the deficiency in this issue by giving 24 pages instead of 16.

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Mr. C. M Giles writes: "We all know that the practice of photography is apt to be productive of surprises; but occasionally we have an experience that seems somewhat unique. Such an one fell to my lot recently. I was developing some 8 x 10 plates, when light struck streaks began to appear in the lower left hand quarter of each plate. Immediate investigations failing to throw any light on the problem of its probable cause, the search was given up as a failure, and the process of development resumed. Soon, however, the mischief-maker betrayed itself, and in a way, to me at least, very unexpected. An accidental turn of the left-hand that brought the palm uppermost revealed a strong play of phosphorescent light, and the mystery was solved A few minutes before I had handled matches with my moist hands, and thus the mischief was done. I do not know as any one else has a similar experience; but I send this as a warning in the hope that it may save others from repeating the annoying complication."

- - - - -

Prof. W. K. Burton, the well-known authority on all matters connected with photography, resides at Tokyo, Japan. He sends us the accompanying photograph and writes: "The photograph itself is far from being anything great, but there is some interest in it, in as much as it represents a *very* characteristic profile of the highest type of Japanese. The profile of a man of the same type would be very similar, but for moustache, etc.

Nobody knows where the Japanese have come from—the Japanese themselves least of all—but, observed merely from an ethnological point of view, there is no doubt, that the race is a mixed one, and that there are three distinctly marked types. The photograph I send you represents the finest type—that from which



most (but by no means all) of the extraordinary energy, intellectual power, and *originality* of the Japanese people have come. I use the word *originality* advisedly, and in spite of the fact that the Japanese are sometimes summed up as merely skilful imitators.

THE NEW ENGLAND CLUB'S FIRST CONVENTION.

THE first convention of the Photographers' Club of New England, was held last month.

The meeting was called to order by the President, Mr. George H. Hastings

"For many years," said Mr. Hastings, "the need has been felt of New England photographers banding themselves together for mutual improvement and benefit. In no way can we so well judge our own work as to see it by the side of others, and careful study and kindly criticism will incite us to better work than before."

Pirie MacDonald of Albany, N. Y. was introduced, and he had several practical suggestions to offer for the consideration of the fraternity. He made a plea for originality in photography. "Why,' said the speaker, "should we copy people who push brushes?' And without having had special training in that direction. He ridiculed the idea of attempting to copy old paintings without knowing what it is that constitutes their beauty. He did not believe in removing every trace of truth from a photograph.

In conclusion Mr. MacDonald spoke of the need of a school of photography, and he said he hoped that with all our schools of art there would soon be established a chair of photography for the advancement of this art, or profession as he termed it

Prof. John Ritchie, Jr., was next introduced, and after exhibiting several very successful photographs of the moon, which have recently been taken by two Paris astronomers, he spoke of the invaluable help which photography had rendered to the sciences. He referred briefly to the X-ray and stellar photography—the success in studying the spectrum. "The photographs taken twenty-five years ago," said Prof. Ritchie, "would not stand magnifying." He described the telescope used in Paris in photographing the moon, and with the aid of a magnifying glass it is possible to see the lines of the surface.

The next speaker was Charles Hetherington of Chicago, who agreed with all that Mr. MacDonald said. He hoped each member would extend the hand of fellowship in the advancement of photography.

The exhibits made are very interesting, showing the great progress that is being made and the various processes in use.

An interesting exhibit is made by G. L. Hurd, of Providence, who shows six portraits of old men from untouched negatives.

The exhibition was open to the public in the evening, and it attracted quite a large attendance. It is one of the finest displays in this line which has been seen in this city. The examples shown are of excellent artistic quality, comprising portraiture, genre subjects, views, backgrounds, and include all the paraphernalia used in the art of photography.

Among the specimens contributed to the exhibition is the exhibit by Rosch of St. Louis, which was awarded the first prize at the National Photographic Exhibition at Chatauqua, N. Y. Pirie & MacDonald of Albany show some elegant specimens of portraiture, and Hurd of Providence some excellent examples of the genre class.

The following is a list of the prize winners

Grand Prize.—The Hastings cup. Two genre pictures, 11 x 14 plate or larger, subject to be chosen by the photographer Won by E. F. Fuller.

Class A.—Six or more portraits, pictures to be from 11 x 14 plates, or larger; first, 8 x 10 Royal portrait camera box, value, $50; second, one case 20 x 24 Climax plates; third, diploma. First, H. Shervee; second, H H Pierce; third, C. W. Hearn.

Class B.—Twelve or more portraits, pictures to be larger than cabinets and smaller than 11x14. First, Darlot No 3, anastigmat lens, value, $45; second, one case Stanley 11 x 14 plates; third, diploma. First, George Bolton. Only award.

Class C.—Twenty-four portraits, cabinets, or some of them smaller. First, Darlot 4x4 portrait lens, value, $35.50; second, 8x15 extension Packard background; third, diploma. First, W. J. Freeman; second, C. E. Shorey; third, D. Beckford.

Class D.—Competition limited to cities of 15,000 or under; 18 portraits 11x14 plates, or some of them smaller. First, 8x10 extension rapid Lloyd special lens, value, $28 50, second case 11x14 American plates; third, diploma. First, D. E. Rowell. Only award.

Class E.—Competition limited to cities or towns of 5,000 or under; 18 portraits 8x10 plates, or some of them smaller. First, semi-centennial camera stand, value $25, second, 5x8 American plates; third, diploma First, M. F. Libby; second, C. E. Brown. No third.

Class F.—Competition limited to towns of 2,000 or under. Twelve or more portraits, any size. First, Voigtlander Euryscope lens, No 00, value $37.50, second, case 5x7 Stanley plates; third, diploma. First C. S. Sherman. Only award.

Class G.—Landscapes, with or without figures, six or more from 6½x8½ plates or larger. First, 6½x8½ view camera box, value $25; second, Thornton Pickard shutter; third, diploma. First, W. G. C. Kimball, second, Tilton & Spuhler; third, C E. Brown.

Class H.—Marines, six or more from 6½x8½ plates or larger. First, case 11x14 Climax plates; second, diploma. First, A. A. Latimer. Only award.

Class I.—Architectural, six or more from 6½x8½ plates or larger. First, case 20x24 Stanley plates; second, diploma. First, Whitney & Son. Only award

Class J.—Portrait groups, two pictures from 8x10 plates or larger. First, case 14x17 American plates. second, 25x30 gold portrait frame; third, diploma. No award.

Class K.—Special prize for honorary members in the United States and Canada, outside of New England, one portrait from 11x14 plate or larger. First, suitable work of art; second, case 8x10 Climax plates; third, diploma. Judged by special committee. First, Pirie MacDonald; second, D. Hoyt; third, Mr. Steckle.

The judges awarded special mention to H. H. Pierce, of Providence, R. I., for a head of an old man. This picture was announced to be the *chef d'œuvre* of the exhibition

A diploma was awarded to H. Shervee of Worcester, for the most tastefully arranged exhibit.

The annual convention in 1898 will be held in Boston.

The following officers were elected to serve the Photographers' Club for one year:

President, W. H. Partridge, Boston, First Vice-President, H. A. Kimball, Concord, N. H.; Second Vice-

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President, H. H. Pierce, Providence, R. I.; Third Vice-President, G. W. Moulton, Rockville, Ct.; Fourth Vice-President, C. S. Sherman, Fifth Vice-President, W. C. King, Portland, Me.; Secretary, B. F. Kenney, Boston; Treasurer, Carl Horner, Boston.

During the two days' meeting 100 new members joined the club.

The convention closed with a banquet at Hotel Thorndike which was tendered by the various firms who exhibited during the convention, and was complimentary to members of the club.

One hundred and one sat down to the banquet.

From 33 members last December we now have over 150.

There were 37 entries for prizes: 23 manufacturers, and dealers occupied spaces for display and sales.

It was universally admitted by many who had attended other State conventions that it was the most successful in every respect.

SOME REMARKS ON LANTERN SLIDES.

A Method of Developing—Partial and Local Toning. General Remarks.

[Extract from "Camera Notes," Official Organ of The Camera Club, New York, Vol. I., No 2.]

BY ALFRED STIEGLITZ.

The past twelve months of the Camera Club of New York will, without question, be known in the pages of its annals as the "Lantern Slide Year"; for in truth, as can be verified by the pages of the old journal, never before was there so much work done or so much interest shown in this most peculiarly fascinating branch of photography.

Slide making originated in the United States, it having been invented, as is claimed, by Langheim, of Philadelphia, some fifty years ago. It at once became popular, and continued to fascinate not only those interested directly in the production of slides, but old and young who simply wish to see pictures in an agreeable way.

Many of our best amateurs devote themselves exclusively to this branch of work, our Mr. Fraser being a notable example, notwithstanding the fact that most of the leading pictorial photographers of Great Britain and the Continent look down upon slide making as outside the "art limits," and therefore beneath their artistic dignity. It has become an accepted fact among them that the process is purely mechanical, and that at best the tonality of slides was incorrect. As for the declaration that slide making is purely mechanical, permit me say, that after a conscientious winter's work in this line of photography, I have come to a different conclusion, and claim that the technique of slide making *may* be quite as interesting as that of the known printing processes, even including the gum methods which are now coming into vogue. Of that more anon. As for incorrect tonality, in most cases that is due to the lack of knowledge and skill on the part of the slide maker, who has not given the matter enough study, or who perhaps does not quite grasp the material with which he is working. In order to properly appreciate a "picture slide," and in this talk remember I *am* only referring to "picture slides," the same must be shown under the exact conditions as prescribed by the maker, for the latter, if thoroughly at home in his work, will make his slides to suit the conditions of light and enlargement set down by him before he begins his picture. It is this factor that makes slide making so unsatisfactory and discourages the earnest worker when he sees his slide on strange screens and quarters. Suppose I made my slide to be enlarged ten times and shown with a light whose intensity is L, so as to give the desired effect, and it is then shown enlarged to 20 *t* and a light with an intensity of L, what is the result? Entirely false values and consequently a false impression. But does this not hold true of prints to a certain extent? How many gems are thoroughly ruined in exhibitions by poor hanging and still more miserable lighting. We see we must make the best of existing conditions, and only show our work there where we may expect reasonable attention to our intentions.

Standard of Slides in the Camera Club, New York.

The standard of the slides made in our club is high, for the judging on test nights has been unusually severe, even hypercritical according to many members who do not understand the motives of the judges. Just criticism, though it may seem harsh at the moment, is exceedingly healthy for the welfare of the club. There is much, too much, back-patting in the ranks of photographers. Honest criticism from capable men ought to be sought, and, when given, ought not to be condemned as discouraging new talent and hurting the feelings of the spoiled children in the ranks. The judges appointed for the year judged slides for their quality, by which was understood the correct rendering of tone values in connection with the other technical requirements of a slide. "Clear glass for high lights and transparent shadows" did not constitute a perfect slide, as the old-timers imagine. A first-class slide, we will not speak of perfection, very rarely contains clear glass, the lack of tone in any part of it being a serious defect. On the contrary, we have seen instances in which a faint veil over the whole slide would have been a great improvement, the subject presented thus gaining in atmospheric delicacy and charm. It is well to remember that veil and fog are not synonymous in this case. Fog is always to be avoided in slides. A luminous body only should be represented by clear glass. We fully appreciate that our audiences nevertheless still go into raptures over the so-termed brilliant slide, by which is meant one lacking in all medium gradation; in short, a black and white one. Such a slide is an abomination to the refined eye, and fortunately our precepts are bearing fruit among our members, and will therefore in due season influence those who come in contact with them; that is, our audiences. A matter rarely considered by slide-makers is that of color, and we are therefore confronted with bright red snow scenes, glaringly pink landscapes, blue architectural interiors, etc., which, though perhaps beautiful in all other respects, are entirely ruined by this shortcoming. This defect is often due to the desire to obtain softness at the expense of color, for we all know that a soft slide is, as a rule, produced by a long exposure and a weak developer—the two factors which are also necessary in obtaining warm colors. In order to control the color of a slide without sacrificing its gradation and quality, it is often necessary to resort to special toning methods. It is upon this matter, and also on my own method of developing slides, that I wish to dwell. The

slides made by me during the past year were all produced in the manner to be described, and by special request I give you my working methods so that any one may be enabled to obtain similar results.

My Method of Developing Slides.

Having given the plate a very full exposure, it is developed in the usual manner with any developer (I personally prefer hydroquinone), with the difference that development is not stopped until the image has totally disappeared when examining the plate by transmitted light. It is then rinsed under the tap as usual, and placed in the hypo bath until thoroughly fixed. Upon examining the fixed slide it will be seen that it is not only so thick that you can hardly recognize the picture, but that it lacks all gradation in being muddy and flat. But this condition is necessary for future operations, all of which take place in broad daylight. On a table place two white porcelain dishes. The one, which we distinguish by calling it A, should contain a one per cent. solution of ferricyanide of potassium, and the other, B, a very dilute solution of hyposulphite of soda and ferricyanide of potassium, say:

1. Ten per cent. solution of hyposulphite of soda.
2. Ten per cent. solution of ferricyanide of potassium.

For use, take 100 parts of 1 and 15 drops of 2.

These baths must be renewed occasionally, as they deteriorate in the light.

In each dish place a small camel's-hair brush and a wad of cotton, which latter may be shaped at will to suit the purpose for which it may be intended. If possible, have the table near running water, otherwise have a pailful at hand, as plenty of water is essential for the delicacy of some of the operations to be performed.

Local Reduction in Order to Build Up Tone Values.

As before stated, in examining the fixed slide by transmitted light, very little of the image will be visible. In order to facilitate matters, bring the slide *directly* from the fixing bath *without previous washing*, into dish A, in which it will be gradually reduced. Stop the reduction as soon as the image is fairly distinct. This is done by plunging the plate into water, thus stopping all chemical action. The slide is still very thick and flat, but it is now in a satisfactory condition for local treatment and the ultimate thinning down to the desired density.

In this state the slide is placed in dish B, and local reduction by means of the brush is began. This process must be very gradual, so that it be in our power to alter our relative tone values or gradation at will. You notice in this local application of the reducing agent we in reality have the reverse of brush development in platinotype printing, with even a much greater leeway. The process of producing slides by this method is highly interesting, for effects not otherwise possible can, with a little skill, be obtained.

It is by this method that some of those striking snow scenes, shown during the winter, were produced. Originally the slides of these were considerably overtimed and overdeveloped, and then reduced in the above described manner. Between every stroke or two of the brush, it is well to rinse the plate, so that the strokes do not show in the ultimate result. No brush strokes ought to be visible when the slide is thrown on the screen; if any be detected the slide is a failure and ought to be discarded. With a little skill and practice, this method is very simple and safe, and any one having succeeded in mastering it will never resort to any other method of producing slides.

Naturally, it is essential to know something of tone values, as the resulting slide might otherwise be ludicrous in its effect. This process of developing a slide is necessarily very slow, forcing being at no stage admissible, as it would insure certain failure.

The Use of Formalin.

In winter the gelatine is sufficiently tough to withstand this seemingly rough treatment, but in summer it is well to soak the slide before the brush reduction is begun in a very weak solution of formalin for about a minute and then rinse thoroughly. The solution used by me is 1000 parts of water to one part of formalin. Sometimes the resulting color of the slide produced in the above described manner is objectionable and possibly rather uneven. To overcome this defect, the slide must be toned in a suitable bath. Among the many experiments made by me, the following will interest you most:

Toning.

In many cases it is desirable to color a slide to a pure blue, or perhaps only a suspicion of blue. An absolutely reliable method to obtain this color is to use the following bath:

Blue.

I	Sulphocyanide of ammonium	300 grains
	Water	32 ounces
	Carbonate of soda (granular)	4 grains
II.	Chloride of gold (brown)	15 grains
	Water	1 ounce

For use take 2 ounces of I and 4 drops of II, always remembering to add II to I, and *never reversing* the operation. This amount of solution will tone at least one slide to a perfect blue. The toning bath, in order to work satisfactorily, ought to have a temperature of 72 to 76° Fahr. Using the bath at a lower temperature results in failure, as the toning proceeds too slowly and unsatisfactorily in other respects. A higher temperature will hasten toning, but the gelatine of the plate is apt to be attacked in a most disagreeable way.

To judge the process of toning, it is necessary to examine the slide by transmitted light, using daylight if possible. A thoroughly toned slide will have a pure blue color when examined in that way. According to my experience, it is advisable to tone reduced slides after they have been dried, especially in such cases in which only partial toning is to be used. As for the density of toned slides, let me say that those toned with the above bath do not increase in density perceptibly.

Green.

In order to obtain a green slide, the following treatment is best:

I	Oxalate of Iron	20 grains
	Ferricyanide of potassium	15 grains
	Water	32 ounces
II.	Chromate of potassium	5 grains
	Water	16 ounces

Bathe your slide, which in this case must be somewhat lighter than the desired result, in solution I. In this bath the color will turn to a dark blue. From this it is placed in solution II for a minute and then dried. When dry the slide will be a bright green.

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Bartolozzi Red.

Bartalozzi red is obtained by using the following bath:

I.	Ferrocyanide of potassium (yellow prussiate)	15 grains
	Water	16 ounces
II.	Nitrate of uranium	30 grains
	Sulphocyanide of ammonium	150 grains
	Citric acid (crystals)	10 grains
	Water	16 ounces

For use, take 1 part of I and 1 part of II, and place your slide, which must be first thoroughly soaked in this solution. It will quickly assume a beautiful Bartolozzi red color. In many cases the whites are stained in coloring the slides in this way, and in order to remove the same dip them into

Carbonate of soda	15 grains
Water	32 ounces

for a moment, not longer, and the stain will disappear. After this operation proceed to wash.

Partial Toning.

In using the gold toning bath some beautiful effects of color may be obtained by so-called partial toning. These colors are obtained by dipping the slides into the toning solution for a short time and then examining them by transmitted light. The combinations of the original ground color of the slide and the partial deposit of the gold, which is blue, give us quite a range of purples, blues, reds, grays, blue-blacks, etc., the color depending upon the ground color and the length of toning. Many of the snow scenes, before mentioned, were treated in this way.

Local Toning with Different Baths.

While experimenting with the above-mentioned and many other coloring processes, it struck me to try and color slides by using these baths on one and the same slide locally. In order to succeed quite a little skill in handling the brush and the various solutions, as well as the water faucet, are essential. And even at that, most slides are apt to be spoiled by the colors running into each other. My mode of procedure is as follows: I take a dry slide, dip into water so as to simply moisten the surface of the gelatine, and then apply the gold toning solution with a small or large brush, as the occasion may require, to those portions of the slide which are to be colored to blue, and shades of the same, and also the blue-blacks and purples, all of which are obtained by the sulphocyanide bath. After these portions of the slide have been colored satisfactorily, an operation which is most trying to one's patience and nerves at times, the other portions are treated successively with the various remaining baths. In most cases the results are exaggerations and also crude; nevertheless such a slide, especially from a chemical point of view, is of great interest. In certain instances, however, such local coloring or toning is of great effect and beauty, especially if the original ground color of the slide be kept and another color simply suggested in parts. Some of the Venetian scenes in which water, sky, and a few houses and gondolas make up the picture, treated in this manner, show up beautifully.

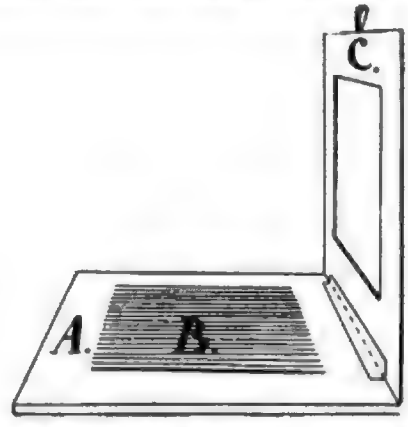
As a general rule the monochrome slide is preferable to those colored by any means whatever, especially for pictorial purposes. Nevertheless an occasional suggestion of color, if used very discriminately and with understanding, relieves the monotony of an evening's entertainment of slides, always remembering that by colored slides I refer to photographically colored ones, and not those tinted by hand with aniline dyes. Those can hardly be included within the limits of legitimate photography.

TO "BACK" PLATES QUICKLY AND CLEANLY.

Notwithstanding the fact that several plate manufacturers now send out their plates ready backed without additional charge, there are many who will prefer to perform this very important office for themselves, doubtless confident that no one can do it better. But those who have "backed" their own plates hitherto are probably not altogether unacquainted with such accidents as the backing medium creeping round on to the wrong side of the plate, red finger marks, and some spots and splashes on the film side, and so forth. The one important desideratum in backing plates is that the medium itself should be on one side of the plate, and that not the sensitive one. This may sound particularly simple in theory, but as practised in the dim light of a dark-room it has difficulties. It is claimed for caramel that it is most efficient for the purpose, but it has a nasty habit of running and sticking everywhere but the place it is needed in.

The sketch below will give an idea of a simple form of apparatus which can be made by anyone in a few minutes, can be packed in very small compass, and prevents any of the backing reaching any but its proper destination—the back of the plate.

A is a piece of flat wood, thick enough to prevent warping, in the centre of which and with a margin of about 6 in. is B, a piece of velvet or soft-surfaced material glued to it. B is cut the exact size of the plate used. C is a piece of card or mill board or thin wood of the thickness of a plate, and is the exact size of the board A,



and has in its center a cut-out space, again the size of the plate in use. It may be hinged to A with a glued piece of material or leather. When C is placed upon A the open space in it is exactly over the velvet, B. Now as to the method of using: The plate, face downwards, is placed on B, C is brought into position on the top of A, and the back of the plate is presented for backing.

If the caramel is kept in a wide mouthed bottle and applied with a lightly rolled piece of cloth, like an etcher's tool for polishing plates, it can be easily rubbed on, and any slight superfluity goes on the card C.

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Then lift up C and remove the plate and rear it up to dry. The whole process of backing the plates takes a far shorter time than to read this explanation.—*Amateur Photograph* (*English*).

THE HUMOROUS SIDE OF PHOTOGRAPHIC DEALING.

BY J. W.

THE questions asked by tyros furnish the most prolific source of amusement to the dealer, and it sometimes requires considerable strength of will to prevent our risible faculties overpowering our ideas of courtesy.

The most frequent error of customers is shown in the case of the pronunciation of the names of the chemicals, a photographic dealer's shop often sounding as though it were a music store, when a customer asks for some harmonium bromide (ammonium bromide); and occasionally as a mechanical engineer's, when a pound of hydraulic acid (hydrochloric acid) is requested. (Is it because of its strength?) All dealers must be familiar with incidents like these.

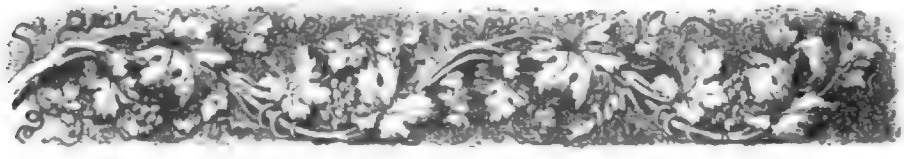
Then we have the business-like person whose knowledge of business methods is greater than the care he bestows in reading instructions. An amusing case of this kind came under my notice sometime since. I supplied a customer with a set of apparatus and materials, according to a list which was supplied to us and had been made out by a friend of the purchaser's. I was instructed to pack the goods and forward them to a given address, together with the invoice, which was duly carried out. Nothing more was heard until one day, a few weeks afterwards, the purchaser turned up at the shop with a pile of fogged negatives, or rather glasses, laid them on the counter and said, "Look here, all those plates you sold to me were bad, I've tried them, and so have several of my friends, and they all say that they are fogged." I told him that they were sold to him exactly as they were received from the maker by me, and then asked him if the packets were b oken in any way when he received them. He replied, "Oh no, the plates were all right when I received th m, because I checked the invoice myself, and counted them and they were all right, the proper number of boxes and 12 plates in every packet, without a mark upon them. They only went like this (holding up a fogged plate) when we placed them in the developing liquor." After this I had to explain the obvious cause, and he went out of the shop with the look of a man who had been injured innocently.

Not long ago a serious-looking person came into my place; he looked desperate. He was going to have this out if he swam in blood for it. I trembled. He laid a small parcel on the counter, and never said a word. I smiled, t'was all I felt equal to. Then he put his hand in his pocket, withdrew a small parcel and said, "This camera you sold me is a fraud. You told me that the pictures would be sharper with the little holes than with the big ones (diaphragms), and the thing does not work at all. You told me the other day that my plates were not sharp, so I put on one of the small holes (stops), and increased the speed of the shutter to take it sharper, and now I can't get anything on the plates at all. You'll just have to take the confounded thing back." After explaining to him that by the term sharpness I meant definition or clearness, and did not in any way refer to the speed at which a photograph could be taken, the worried look quietly passed away and he became almost happy.

Similar experiences to the above are common. Only the other day I advised a customer to use rapid plates, in a hand camera as the day was so dull, and he intended to take snap-shops; but was met with the remark that the camera was so-and-so's camera (naming a very good firm of dealers) and the camera was so quick that it only needed quite ordinary plates, in fact he added, "it's an instantaneous camera. When in this condition they are hopeless; sold him some ordinary plates."

A friend of mine, a dealer, told me some time ago of a very humorous question he was asked in the shop by a thin, timid-looking young man, who commenced by saying that "I'm sorry to trouble you (this is very rare), but I wish to take a photograph on Saturday and I have a half-plate camera but no lens. A friend of mine promises to lend me a lens, but it is only quarter-plate. If I only took a quarter-plate photograph with the lens, do you think it would strain the lens if I used it on my half-plate camera?"—*The Photographic Dealer*.

Photography as a Riddle Solver.—Some of our older readers will remember, says *The British Journal of Photography*, well on towards half a century ago, the discussion as to whether the moon does really revolve on its axis, as was usually stated. This really is a scientific riddle, just about equal in calibre to the popular one, which asks whether any one can be said to go round a monkey on a pole, if, while the observer walks once round the pole, the monkey keeps twisting also, so as to keep his face to the pedestrian. Now the same puzzle is taking place about the rotation of Venus, and Herr Gümpell stated, at the last meeting of the British Astronomical Association, that it had struck him that photography might be employed to solve the question, by means, not of a continuous picture, but of impressions taken at repeated short intervals.



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NOTES.

The Manhattan Optical Co. of Cresskill, N. J., sends us a copy of a neat little catalogue containing descriptions of the cameras, lenses and photo supplies that they manufacture Every amateur should purchase a copy.

The Bausch & Lomb Optical Co. inform us that notwithstanding the fact that the American market is open to all the other licensees of the Zeiss patents, the sale of their Convertable Anastigmat Lenses has exceeded their anticipations and taxed their new plant to the utmost to keep up with the demand for these extraordinary lenses.

Apropos of the introduction of the new words "Rayfiltergraph" and "Rayfilterography," a definition may be in order for those who may not have been fortunate enough to have learned by experience the application of the terms. A rayfiltergraph is a photographic negative or print made with the aid of the rayfilter. Rayfilterography is the art of producing rayfiltergraphs.

Recent Experiments with the Rayfilter in connection with the Kodak have demonstrated that excellent results may be obtained on the film regularly furnished with those cameras. The Bausch & Lomb Optical Co., manufacturers of the bicromate of potash Rayfilter, have adapted a special filter so that it can be used on the Bullet Kodak. Every owner of a Kodak or film camera should send for the booklet "Rayfiltergraphs," Dep. H., above company. A copy will be sent free.

Solubility of Silver Chloride in Ammonia.—In a theoretical paper bearing upon the conditions obtaining during the admixture, under varying states of pressure, of ammonia and silver chloride, Mr R. Jarry, in *Comptes Rendus*, gives a table of the solubility of silver chloride as follows:

NH_3 ..	'143 ..	'204 ..	'360 ..	'624 ..	1'177 ..	1 636
AgCl ..	'049 ..	'136 ..	'344 ..	'400 ..	'468 ..	'518
NH_3 ..	2'816 ..	2'98 ..	3'019 ..	3'243 ..	3'450 ..	3'748
AgCl ..	'659 ..	'709 ..	'725 ..	'587 ..	'477 "	'30

The remarkable fact is here shown that, up to a certain concentration, increase of strength in the ammonia solution brings about an increase in the amount of chloride dissolved, but that, when a certain point is reached, any further strengthening of the ammonia leads to a decrease in the silver chloride dissolved.

Light and Shade.—It is well known to artists that an arrangement composed of strong lights and darks only, cannot have the essential quality of breadth. It will be spotty like a chess-board, for want of half tone to connect the extremes This effect is familiar to most photographers, and especially so when a strongly lighted subject is under-exposed, and still more so if this result be over-developed. Three chief factors should be remembered as affecting breadth of effect—first, the natural lighting and arrangement of the subject; next, an ample but not excessive exposure; thirdly, the development of a soft rather than vigorous negative.—*A. P. Note Book.*

Borax as a Restrainer of Development.—The addition of a solution of borax to any alkaline developer is said to exert a wonderful restraining influence.

The following strength is recommended:

Borax	30 grains
Water	1 ounce

One drop added to an ounce of developer is enough for slight over-exposure, a few drops will completely arrest development at any stage.

A Reducer for Bromide Prints which does not Stain.—An ounce of strong and fresh chloride of lime or bleaching powder is stirred in water, after which the liquid is filtered through paper. The bath thus obtained will not only reduce bromide prints rapidly, but will leave no yellowish tint, as is often the case with the ferricyanide and hyposulphite reducer. More than this, the chloride of lime will tend to clear away any tint on the whites; indeed, it will tend rather to harden the print by eating out the lighter tones. For certain subjects and effects this may be desirable; but if a slight action in this direction is objected to, the chloride of lime bath should not be used. A thorough washing is all that is required after the chloride of lime bath.

The above-mentioned solution is excellent for removing the yellow tint sometimes acquired by platinotypes, this tint being something quite apart from the true image of metallic platinum. For this purpose the bath may be made more active by adding a drachm of hydrochloric acid to each pint.

Largest Camera in the World.—An enormous camera has been constructed and is now being used in San Francisco. It found its necessity in the Fair will contest, and was conceived and built by Theodore Kytka, the artist and expert in micro-photography and chirography. Mr. Kytka, who was employed by McEnerney & Goodfellow to investigate the pencil will the day on which it was filed, believed the document to be a forgery. Charles Fair's attorneys, Knight & Haggerty, decided to take every possible means to establish Kytka's theory. So they built this camera.

With it an exact reproduction of any writing can be magnified 3,600 times. This means that a letter one-twentieth of an inch in heighth can be accurately pictured fifteen feet tall. In this way, photographing one

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minute section after another, the pencil will could be reproduced so that each page would be 3,000 feet wide and 5,100 feet long.

The results obtained were a revelation, says the San Francisco *Examiner*. Never had there been so elaborate a plant in this country or in Europe. The police employed this camera to assist in the Becker and Creegan case, where a check on the Nevada Bank was raised from $12 to $22,000. The first work to be done was to show that the check for $22,000 was a forgery. The process employed was as simple as it was effective.

The check was placed between two sheets of glass and in focus before the camera. It was then photographed, enlarged several times with a strong reflected light from behind, emphasizing not only the fibre of the paper but the lines on it. That photograph told the whole story. The camera brought out faintly the letters "lve" which had been erased with acid by the forgers before they changed the word "Twe-lve" to "Twenty Two Thousand." What was more, the ink in the first three letters was shown to be different from the rest. The photograph showed too that the original check had been blotted, while the letters that had been painted in were allowed to dry. The patches that had been used in filling the holes in the paper of the check made by the perforating machine were also made evident.

Coloring Prints by Partial Toning.—Dr. Rautert, of Mayence, read an interesting paper before the recent meeting of the *Verein Zur Pflege der Photographie und verwandter Künste* at Frankfort-on-Main on coloring prints by means of various toning baths, but without the use of color. The print is first washed to remove excess of silver, but this must not be carried too far or the print will tone very slowly. While still wet it is placed in a dish inclined at a slight angle and then is retouched in the shadows with a camel's-hair brush dipped in a solution of chloride of gold. Each portion of the image after retouching is washed in running water to avoid the solution spreading to the untoned parts of the print. After the shadows the chair is tinted, if it be a portrait; for red brown by the aid of a solution of chloride of gold, for deep brown with a more concentrated solution, for black with a solution of chloride of gold followed by chloroplatinite of potassium. Portions of the print requiring it are then toned gray or black with platinum. In order to give a much deeper black tint to the pupils of the eyes, the print is washed with water, then, after drying, except just round the middle of the eye, chloride of gold is applied to the pupil and the eyelashes. After the various tonings the print is fixed with hyposulphite in the ordinary way and washed. If the shadows between the hair and the forehead remain too red, they can be eliminated even after fixing by the application of chloride of gold. The coloring of the face is then proceeded with, using very dilute ferricyanide of potassium. A bronze medal has been awarded to Dr. Rautert for his interesting communication.—*Bulletin of the Photo-Club de Paris.*

An Important Point in Fixation.—Mr. C. Welbourne Piper brings a matter of interest under notice with reference to loss of density in fixation, in an article in the *British Journal* for the 29th ultimo. "In cases of normal exposure," he points out, "development is never carried as far as possible; consequently the film, when immersed in the fixing bath, must contain a considerable proportion of partially reduced silver haloids or subsalts, which will be decomposed by the hypo into metal and soluble normal salt; that is to say, metallic silver is reduced during fixation. If this reduction takes place in the presence of a haloid salt, a soluble haloid salt of silver may be formed, and metal lost that otherwise would go towards making up the density of the image. It is fairly obvious that loss of density in the fixing bath depends a good deal upon incomplete development. An under-developed film loses a great deal even in a plain hypo bath, while, on the other hand, an under-exposed film that has been subjected to forced development, loses very little. In the first case the development of the exposed particles is very incomplete, and a great deal of subsalt must be carried into the fixing bath; in the second case, the reduction of the few particles exposed is fairly complete, and very little subsalt remains. It therefore seems highly probable that loss of density is mainly due to the presence of subsalts in the film; or, in other words, to the reduction of metal in an extremely fine state of division during fixation." This explains why "hard" negatives become harder in fixing, and negatives with any tendency to "thinness" correspondingly thinner.

The Manufacture of Colored Screens.—In *Photographischen Correspondenz*, Dr. Eder gives some interesting hints about the making of colored screens. He specially recommends the gelatine preparation with colored collodion. The same concentration is given to the gelatino-chloride as is usual in the manufacture of plates, and a few drops of acetic acid are added in order to make the coating smoother and less liable to form streaks. This colorless coating of gelatine is allowed to dry on the glass plate, which is then dipped into the colored solution and after a short washing again allowed to dry. Picric acid is a suitable dye for light yellow; Manchester yellow is a stronger absorbent for blue-green. Orange yellow is produced by orange naphthol. Lastly, an orange-red tone can be obtained by erythrosine. It is recommended for golden yellow to fix together a picric and Manchester yellow plate. If it is desired to entirely do away with the blue-violet and the light blue, a plate of glass is dyed in picric, then in Manchester yellow, and lastly combined with another plate which has been dyed in β orange naphthol. Such plates give with erythrosine plates only, yellow-green; with fluorescent plates only, green. For cyanine plates, when only red and orange effects are desired, the orange-yellow plate is combined with one colored with a coating of erythrosine. For very fine work, as for example, three-color printing, the use of such glasses may give rise to a defect, in that they are not exactly optically parallel, and therefore alter the focus for each picture. For this work, the use of glass trays with glasses worked exactly optically is recommended.

Enlarged Negatives.—The whole success of the method of making an enlarged negative according to G. Haumer Croughton, depends upon the transparency, and the reason he assigns for so few photographers succeeding is because they do not realize that the transparency

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must be what most would call over-exposed and over-developed. A transparency which would be all right to hang in a window with a ground-glass backing would not yield a good negative. It must be covered all over, except the very highest lights, and must have unbroken gradations from top to bottom of the scale of tones, no bare glass except a very limited number of the highest lights in the picture, and these must be led up to by fine gradations. In using dry plates for this work choose a slow plate, and preferably a plate that can be used with an oxalate developer. You will get a much cleaner transparency, and the color will be much better for reproducing the negative from. If the transparency should need strengthening it can be done with bichloride of mercury followed by ammonia. But be *sure* to *varnish* your negative. In my experience I found that it was best not to make the transparency too sharp. Do not use too small a stop in the lens, and if the grain is too coarse turn the lens out a little *away* from the ground glass. This is important, as if you turn the lens in *towards* the ground glass the effect is very different. This will soften and make indefinite the coarseness of grain which is seen in all enlargements, and enable the retoucher to do his work better, and loss of sharpness can easily be remedied by the pencil, working around the eyes, developing the pupil, defining the line round the outline of the ball, the line of the lash, eyelid, etc.

How to Imitate Oil Paintings.—To take a photograph direct from life that, when painted, has the appearance of being a copy of an oil painting, and to do it without retouching the negative or any extra trouble in printing may seem to those who are unacquainted with the method an impossible operation. It is, however, a very simple one, and involving as it does, the use of no accessories not ordinarily found in the house, those who wish to experiment need not be at a loss for the means.

The effect is accomplished in the following way. For the best results, stretch a piece of white Russian crash on a board, clothes-horse, or stretcher, if one is handy. See that there are no wrinkles; it must be stretched perfectly smooth. Now place this screen, which may be of any convenient size up to a yard square, in a good light where it will receive even illumination, place the camera before it and obtain a sharp focus upon the texture. If the picture is to be as small as cabinet size, place the camera at such distance from the screen as will reduce the size of the grain or weave, but if it is to be 8 x 10 or 11 x 14, it is better to take the grain full size, or even a little enlarged, all of which is easily accomplished by placing the camera nearer or farther from the screen, and extending or reducing the distance between lens and ground glass by means of the bellows.

The focus having been obtained, insert the plate-holder and expose sufficiently, being careful, however, not to overtime it, as the plate has still another exposure to receive after this.

This much having been accomplished it only remains to pose the subject before a white and evenly illuminated background; a sheet with all the creases ironed out will do nicely, and take the picture in the usual manner. As the speed of the plates is slightly increased by the preliminary exposure on the white screen, some little allowance may be made.

Upon development the face will be found as nicely smoothed as though retouched, a faint hatching being barely perceptible if both of the exposures were properly timed. The background will have a pronounced grain like one gets in copying a painting, and in the dark parts, a black dress or coat for instance, this grain will be but faintly visible, the dark values having almost completely eliminated any traces of the first exposure.

The negative after drying is ready to print, and according to its density should be printed either on matt-surface aristo or platinotype paper, and will be found not only a curiosity but an exceedingly beautiful picture, well repaying one for the slight extra trouble expended to produce this effect.—*Cycle and Camera*.

Changing Plates.—A sheet of non-actinic paper may be easily carried without increasing bulk or weight, and this may be wrapped round an ordinary candlestick and the lantern extemporised.

The reflected light coming out of the top and thrown on to the ceiling will not matter. Indeed, it may be found by experiment that plates may actually be changed by reflected white light, but, of course, if they come in contact with a direct ray the result is fog.

If the paper, therefore, has been left at home, and this is probable, as it is so simple, the best plan is to get an ordinary candle, and place it lighted in its candlestick in the fireplace. Then if a sheet of newspaper be placed in front of this, the light is sufficient for changing purposes—if you don't dwell on the matter.

In the daytime it is useless attempting to extemporize a dark room, for rays of light will probably be discovered in every cellar and outhouse, with the exception of the coal-house, which is a little too dusty. But plates may be changed in one's bed, putting the slides well underneath the clothes to open them, and emptying all before the refilling is commenced. Gum the plates all together with strips of paper, and then place the full plate-box underneath the clothes, empty it, and put the exposed plates in, and replacing the lid, bring it out. Then put each slide under in turn and fill it. Finally replace the balance of unused plates in the box and the trouble is over. It is certainly a hot, tiresome process, but it is not so hot as being locked up in a wardrobe with a friend outside between you and suffocation, nor as tiresome as that lingering fear that the changing place which you have used was not safe, and that your plates are already, before exposure, fogged.

The Dim Light from a deep ruby lamp is depressing enough to many a poor prisoner of the dark room, and it is not matter of surprise that the knowing ones of the photographic fraternity affect the more cheerful rays of orange and canary—safe enough if of the proper tint. Some time ago we noticed some experiments made by certain enlightened medicos in relation to the cure of disease by the use of "baths" of colored lights, drawing inferences therefrom of fact and fancy.

But a French physician, like the true gallic cock, goes one better. He finds that by placing a melancholiac in a room papered with bright red, and whose windows and doors share the same inspiring color, the mopes and

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dumps disappear in a few hours, albeit the patient had suffered from them for months previously.

Yet another case. A lunatic who had become reduced to little more than skin and bone through obstinate refusal to take food, was subjected to the same treatment. The following morning he shouted for breakfast, and the asylum cook could not prepare it fast enough for him.

Another and unruly subject was placed in an altogether violet chamber, violet being, as we all know, the color of depression. Hence "the blues." In twenty-four hours he was quite tame.—*The English Amateur Photographer*.

A Substitute for the Lens Cap.—The cap of the lens is very easily lost when one is tramping about the country in search of the picturesque, and very often the loss is regarded as a serious one, involving much searching of mind and exercise of ingenuity to find a substitute. But it is really very easy to do without it. So easy, indeed, that in some cases, the cap having been lost, it has never been replaced, the make-shift being actually preferred to the convenience which it was used to take the place of. At the last moment, before drawing the shutter of the dark slide, the focusing cloth having been wrapped over the camera as usual, fold one corner of it into a little wad around the fingers, and hold firmly in contact with the lens hood. Draw the slide, and the right moment having arrived, make the exposure by simply raising the hand an inch or two, and then cover the lens again in the same way, while the shutter is replaced. It is quite possible to make so-called instantaneous exposures in this manner, of quickly-moving objects; indeed, it is quite astonishing how very rapidly the hand can be moved to uncover and cover again the lens, and the dodge should be tried by those who find themselves unable, when afield, to photograph certain coveted subjects, owing to the fact that they have left their instantaneous shutters behind.

Quick-Printing Negatives.—Owners of yellow negatives will do well to bear in mind that they may be made into quick printers by giving them a blue tint. In the dull days of autumn this is a decided gain. A few minutes' immersion in a strong sulphocyanide toning bath will usually give the desired result. The following strength is advisable:

A.

Ammonium sulphocyanide	30 grains
Dissolved in water	2 ounces

B.

Gold chloride	2 grains
Water	2 ounces

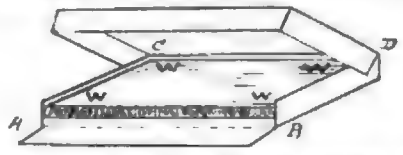
Add B to A.

This will be sufficient to tone several half-plate negatives.

Stoppers.—It is worth while, to avoid stoppers of bottles fixing, to give them a slight coat of vaseline from time to time. If, however, one has stuck, it may be removed by pouring a small quantity of oil round the inside of the rim, and then placing it before the fire until it is thoroughly warmed, when the stopper may be gently screwed round, or the bottle may be placed in hot water and the same course adopted.

Brushes.—Very useful brushes for the application of mountants, reducers, restrainers, or for use in the glycerine and oxalate development of platinotype prints, may be made by cutting off lengths of glass tubing and stuffing into one end a piece of sponge. The tubing can be obtained in long lengths at any chemical material dealer's, and is cut by marking with an ordinary file, and then snapping smartly. Afterwards the edges can be smoothed off in a gas flame. The brushes should be about six inches long and half inch in diameter. From time to time the sponges may be taken out and thoroughly washed and then replaced.

Printing Papers—a Convenient Method of Storing.—Several of the ordinary silver printing pppers have a tendency to curl up, so that it is a convenience to keep them flat, and at the same time cut up into suitable sizes easily get-at-able. The following contrivance has been



proved by the experience of several years to be eminently satisfactory. An ordinary "lid" plate box is taken, and along two edges of the lid a slit is made. The part that now hangs free is attached to a corresponding edge of the bottom of the box, by means of glue. The hinge edge so formed as at C D in the accompanying figure is also strengthened by a strip of calico glued down along the hinge edge, outside, and so not shown in the diagram, though its position can be imagined outside the junction C D. In the same way the two opposite edges of the bottom are slit up, so that the front edge, A B, may hang down flat. This hinge edge, shown as a dotted line, is in like manner strengthened by another strip of calico glued on outside the box edge. The paper cut up is stored in envelopes (with only a narrow flap part) made of a stiff, shiny, red material, rather like that sometimes used for blinds. These retain their stiffness for a very long time. To keep all flat, three or four old negatives are neatly wrapped up in brown paper and form a weight, as at WWWW; the envelopes containing the paper being under this weight with the narrow flaps easily get-at-able. The flap of the box A B is raised up before the lid is shut down, and thereby kept in position. It will be found that most, if not all, silver papers keep longer if kept face to face, *i.e.*, sensitive side inwards. When any sheets get discolored beyond possibility of use, do not throw them away, but keep them for the outside sheets facing the good paper between them.—*The Amateur Photographer* (England).

Cupric Nitrate Printing.—The following writes "Jacob," in the *Photographic Life*, is an easily worked process, giving good results:

Take any kind of paper; if unsized, it may be sized in a bath of

Arrowroot	160 grains.
Water	20 ounces.

Then it is floated on a bath—

Uranic Nitrate	40 grains.
Cupric Nitrate	8 grains.
Water	1 ounce.

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This operation should be performed in the dark-room, also the drying.

The printed image is faintly visible, as in the case of platinotype; experience will soon tell how far printing is to be carried. The image is then developed by floating the paper on a solution—

Potassium ferricyanide.....	20 grains.
Water.....	1 ounce.

This gives an image of a warm brown color, which is fixed by a thorough washing in running water, or black tones may be obtained, after a slight rinse, by floating on a bath—

Bichloride of platinum.....	4 grains.
Water.....	1 ounce

Remarkable Photographic Effects from Fireflies.—The ninth volume of the *Journal of the College of Science*, Imperial University, Tokio, contains a very remarkable account of some photographic experiments with these insects by Mr. H. Muraoka, Professor of Physics, at Kyoto. He placed from 300 to 1000 of the flies in a flat box, and confined them in their place by a linen net. A dry plate, having in contact with it a variety of objects—plates of various metals, cardboard, thin wooden boards, &c—was wrapped in severals folds of black paper, and, after being placed in the box with the fireflies, left there for two days. The plate was then developed, and distinct images of the objects were produced. The conclusions arrived at by Professor Muraoka are: (1) The light from the flies behaves like ordinary light; (2) the light contains rays that pass through cardboard, metal plates, &c.; (3) when the photographic plate is covered by layers of cardboard, it presents an appearance which calls to mind the permeability of iron to "magnetic lines of force"; (4) the properties of these rays appear to be influenced by the materials through which they have passed, perhaps by the thickness of the materials; (5) the properties possessed by the radiations as specified in No 2 are apparently non-existent, or at least, undiscoverable, until after "filtration" (the Röntgen rays are similarly undiscoverable until after "filtration," *i.e.*, through the glass of the Crookes' tube, and "filtration" may perhaps afford a means of rendering the X rays homogeneous); (6) the "filtered" firefly rays can be reflected. We have not the original communication by us, the above description being an abstract from the *Lancet's* account, but it does not appear impossible that the action may arise from some cause external to the fireflies, as, for example, the influence referred to on previous occasions, whereby apparently an electrical discharge gave images of the relief matter on coins, medals, &c., a subject again taken up by Mr. James l'Anson in last week's *Nature*.—*British Journal of Photography*.

Effects of Electrical Discharge on Photographic Plates.—Mr. l'Anson now considers that the wire-skeleton radiographs, recently described by him in the *British Journal of Photography*, are not electrically produced, but are brought about by the "unequal loading of the film with silver particles, which set themselves in the pattern shown when the film is raised to a temperature near boiling point." In his latest experiments, Mr. l'Anson, to test Professor Smith and Mr. Sanford's theory of electrical radiation being the cause of the coin images, performed the following experiments: "I have placed a sensitive plate between two sheets of ebonite about one-sixteenth of an inch thick, which were placed upon a brass-face plate, and a coin laid on the upper ebonite plate. The positive pole of the coin was connected with the brass plate, and the negative with the coin, and current passed for about two minutes. On development, an image of the coin came out showing the design and a radiating halo but out of focus and somewhat blurred, as might have been expected, as the coin was separated from the plate by the thickness of the ebonite sheet. This seems to point to some other action than the luminous discharge, which was plainly visible on the upper surface of the ebonite round the coil."

Mr. Crookes on the Physiological Effect of Roentgen Rays.—Mr. Crookes, in the *Comptes Rendus*, of the Paris Academy of Sciences, referring to the painful effect produced on the hands, etc., of some persons exposed to the rays, states that he is inclined to think that the very energetic action sometimes observed with these rays depends, up to a certain point, on the idiosyncrasy of the experimentalist. He himself, though, as he states, he has been exposed to the action of the rays for a longer time than most experimentalists, has experienced no effects either upon the face or hands. At the same time he points out that he has witnessed in others very marked physiological effects. Our readers, who are familiar with the use of bichromate of potassium will readily understand how easy this variety of experiences could exist, seeing that one man may dabble with impunity all day long in bichromated water, while another suffers from a violent eczema if but a small quantity of such solutions is used for a short time only.

Kites for Observations in War.—We find that the suggestion we made some time ago as to the use of kites as a medium for taking photographs of the enemy's position during war time is now a realized fact. According to the *Daily Mail*, Captain Baden Powell has, by the aid of a kite, ascended a considerable distance in the air, and from there made observations. He says: "One of the most important of the uses to which a kite can be put is photography. If a camera could be suspended high in the air, so as to take a picture of what is underneath, it would be of inestimable advantage for the purpose of discovering guns in a hostile fort, also for the making maps of unknown ground." Captain Baden Powell produced a wonderfully distinct picture of a house and grounds from an altitude estimated at 400 feet, and every path, fence, and wall, was clearly shown. "At present I use a camera, the shutter of which is released by the burning of a slow match;" but he is having a clock-work arrangement made, by which he expects to be able to take half a dozen consecutive pictures at regular intervals of time.

The Gum Bichromate Process in Three Colors.—Ritter von Schöller, whose charming little picture was medalled at the last Pall Mall Exhibition, has been using the gum process for producing three-color prints, and gives in the current number of the *Wiener Photographische Blatter* some details of his method of working.

For the yellow plate he uses a cell filled with equal parts of solutions of methyl violet and rhodamine, the strength of which is not stated, but must be found by trial and error; as red, blue, and violet should not print, these colors must be opaque in these places, and he used Albert's emulsion "eos," and added ten per cent. dye of the R. P. sent out therewith, but Lumière's red sensitive plate may also be used.

For the red-printing plate a yellow and green sensitive plate should be used, and a filter of cupric chloride with some sulphate of copper.

For the blue plate a solution of aurantia, or a dark aurantia dry screen may be used.

As pigments, Milori blue, gamboge, and Munich lake were used, and applied to the papers with bichromated gums, and further treated as has lately been described in these columns. The process is practically the same as that about three years ago published in the *Photographische Correspondenz*.

Herr Walzek, who has also been working this process, uses an ordinary plate without a screen for the yellow plate. The red printing plate is made behind a Lumière dark yellow screen, with a Lumière A or Edwards plate. The blue-print plate is made behind a copper-red glass screen, and on a red and orange sensitive Lumière B plate. Walzek uses the same pigments as Schöller, but coats his paper with a two to five per cent. aqueous solution of shellac.

Hints to the Photographer in Dark-Room.—See that the room is perfectly secure from white light; look to the fireplace, if there is one, and the chinks under the door; if there is a skylight temporarily covered with some material, see that it is tacked down closely and not allowed to flap with any wind. Work with clean dishes, glasses, and hands. Clean all dishes after use and rub dry or leave in a rack to dry. Keep one dish for hypo and renew the bath frequently. Tidiness in a dark room will reward the operator handsomely. For development, have all bottles labeled clearly and within reach of hand; have a solution of bromide of potassium close to your side. If expecting over-exposure, work with less of No 2. Let measuring glasses be clean and beware of those with broken bases. Have a lamp that burns well and does not smoke. Have as much ventilation as is possible. Do not fix a plate the moment the detail has appeared; beware of this, especially in rolls of films; obtain good density. Have as much clean cold water as ever you can. If not laid on, have several buckets, rinse well in various stages. Do not leave a finished negative in a black dish in a sink where there is a hot-water tap. Start with a weak light at first, and remember that a minute is a long one in a dark-room.—H. L. in *The* (English) *Amateur Photographer*.

The Twentieth Free Art Exhibition will be held in the galleries of the Bridgeport (Conn.) Public Library, from Oct. 10th to Nov. 27th, and will include a special section for a display of photographs taken by cyclists awheel. Contributions of photographs framed or simply mounted are asked from all wheelmen. Exhibits will be returned promptly, without expense to exhibitor. Address W. J. Hills, Superintendent

The Well-known Voigtlander Lenses, both Portrait and Euryscopes, as well as the now famous Collinear Lenses, have been slightly affected by the new tariff; but in justice to the importers and American agents—Messrs. Benj. French & Co., of Boston, Mass.—it must be said, that the increase of the retail price is no more than the increase in the duty.

The photographers need not be told that the above named firm has always had at heart the interests of the fraternity and have done all in their power to keep the duty on imported lenses, such as they have handled for over fifty years, down as low as possible, and that the are not in the least responsible or desirous for the increase of duty.

The above remarks apply also to the popular and genuine Darlot lenses, also imported for the American trade by Benj French & Co., who are prepared to send a revised price list of their lenses on application.

Duplicate Negatives and Direct Positives.—In No. 398 of *Photography*, a full account was given of Balagny's method of making direct duplicate negatives without the use of diapositives. That the plan recommended gave perfect results there could be little doubt, and, on the principle therein laid down, direct positives, instead of negatives, have been made in the camera for employment in certain mechanical processes. Professor Namias, however, now claims to have gone beyond this. So far as the exposure of the plate in the camera and the manner and extent of its first development are concerned, there is practically no difference between the courses suggested by Balagny and Namias. The plate is fully exposed and developed slowly with a hydroquinone developer until the deepest blacks have fully penetrated the film, and the picture is plainly seen on the reverse side; after which it is thoroughly washed to remove the developer. Instead now of making the second exposure, and then transforming the silver reduced in development into a chromate, Prof. Namias suggests the prior application of the bichromate bath. For this purpose, he employs a solution of 150 grains of potassium bichromate in 34 ounces of water, rendered slightly acid by chromic acid, which does less harm to the film than nitric or other acids. After the plate has been immersed in the solution, the dish containing it is taken out of the dark room, and bright diffused light is allowed to act until the black image produced by the developer is completely changed to a bright yellow, the color of silver chromate. No change takes place in the unreduced silver bromide, which remains as it was left by the developer. Now comes the peculiarity of Dr. Namias's method. Having discovered that sulphite of soda is a perfect solvent of chromate of silver, while it practically leaves untouched silver bromide, he hit upon the idea of using it for the removal of the primary image, and then reducing by the usual means the bromide left on the plate. When the silver image has been completely changed to a chromate, the dish is carried back into the dark-room, and the plate is there thoroughly washed. It is then immersed in a solution containing about five ounces of sulphite of soda in thirty-five ounces of water, and left there till the chromate of silver image is entirely eliminated. In a few minutes nothing remains save the bromide of silver that has hitherto been unacted on by light. The plate is then removed from

the sulphite solution, washed and exposed for a few moments to the light given by a match, which impresses the silver bromide. It now remains only to blacken the bromide to obtain a perfect negative or positive, according as the object photographed was a negative or a positive. Obviously, the blackening must be effected by one of the reagents known as developers, but it will be generally found that the diverse treatment to which the plate has been subjected renders the developing action somewhat difficult. The solution best adapted for reducing is made up of:

Amidol	5 grammes or 77 grains
Sulphite of soda crystals	40 grammes or 616 grains
Water	1000 grammes or 34 ounces

Should this fail to sufficiently blacken the bromide, washing in a weak (1 to 1000) solution of bromine and resuming development will soon put matters right. As fixing is a superfluity, once the bromide has been sufficiently blackened, a simple wash in plain water completes the operation. If the various stages have been carefully followed, the plate should show a clear, bright image; but if, owing to insufficient first development, there be a veil, which is inimical to good results, it may be removed by a weak reducing bath containing one per cent of potassium ferricyanide to five per cent of hypo. A slight fog does not much matter, and might be left alone.

The Photographers' Association of Ohio, can congratulate themselves on the immense success of their seventh annual convention and exhibition, which was held on August 31st and September 1st at Columbus, Ohio.

The convention was called to order Tuesday morning, August 31st, by President Geo. B. Sperry, of Toledo. The beautiful assembly hall on the seventh floor of the Great Southern Hotel, where the convention was held, was well filled when Hon. Gilbert Stewart, President Board of Trade, was introduced to deliver an address of welcome. Mr. Stewart made a very pleasing address, and was heartily applauded.

On motion, the reading of minutes of former meeting was dispensed with.

President Sperry's annual address —

President Sperry's Address.

Ladies and Gentlemen and Members of the Photographers' Association of Ohio: Perhaps I should apologize for the length of this address, and perhaps, too, for the tenor of it. It is pleasanter to hear that our art is sailing smoothly and proudly into the haven of our desires, to believe that our association is on the crest of a tidal wave that nothing can arrest. I might talk glibbly of the artistic advancement of our profession, and I could find much to encourage such a theme. I might point proudly to the past achievements of this association and predict a succession of triumphs for the future, but I should fail in what I consider my most important duty if I did not call your attention to some of our deficiencies and suggest a remedy. Our method of conducting our business meetings, or rather our lack of method, deprives us of much of the benefit they might give us. We are very poor legislators. We haven't the courage of our convictions. We allow measures that we cannot endorse to go through for fear of arousing enmity. We lack that fine diplomacy that makes us combatants on the floor and friends in the lobby. It was suggested by one of the speakers at Celeron, Mr. Bellsmith, I believe, that the members form two parties and contest the elections. This is an excellent suggestion, and we are in good shape to put it into practice. I heard a member allude to some others who are known to advocate extreme views in lighting as the portrait painters. Some of our best workmen do not believe that these extreme views represent legitimate photography. Here is a chance for opposition, array yourself upon one side or the other. If the nominating committee do not put on the men who represent your views see that they are put up and work for them.

For several years we have had the benefit of the best art instruction that could be secured, but heretofore too little attention has been given to technical demonstrations. It is to be hoped that your presence this year at the sessions of the school will encourage those who are giving their time and their knowledge for your benefit. We cannot as professional photographers afford to let our instructions be one sided. Artistic excellence can never supply the the deficiencies of technique. The untidiness of the displays has been a matter of comment among those who understand the value of environment. The setting of a portrait is so important a matter that I earnestly beseech you to give it more careful study. A better knowledge of colors and their complements and a taste for restful tints would soon do away with the conglomeration of effects that distress and bewilder the eye.

I should like to see this association do something to better the social standing of the photographer. The lawyer or the doctor is accorded a standing in his community by reason of his profession. The photographer has none save what he acquires through his own personality. This is not as it should be. Isn't it a lamentable fact that the lawyer whose success ofttimes depends upon his ability to misrepresent and deceive, whose notoriety is too often gained by his championing the cause of injustice, and even of fraud; isn't it lamentable, I say, that he should be ranked higher in the social scale than the photographer who can best achieve success through his culture and refinement, whose profession fosters and encourages the cultivation of those graces that are beneficial and ennobling. I quote Mr. Bellsmith again in saying that the habit of keeping our places of business open on Sunday has much to do with our social position. We cannot make any advancement until we arouse some opposition to this degrading custom. I do not believe that legislation is the remedy, at least not as an initiative step. Educate the man, his self-respect will do the rest.

The general business depression which has been gradually settling down upon us since 1893, has apparently reached its turning point and we can look forward with some confidence in the hope that the fall trade will prove a business revival for us. The extremely poor business of the last six months has raised the query as to whether or not the demand for our products was not dying out, and if so, what is to be the future of photography. This is a pessimistic view scarcely worth considering and by no means warranted by the facts. People are ready as ever to spend their surplus dollars for whatever interests them. If the dry goods mer-

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chant or the jeweler can interest them more than the photographer they will get more of the dollars.

To what extent is our lack of business due to lack of enterprise? If it be necessary for the merchant to expose his wares in never ending variety and to use every means at his command to draw customers, is it necessary for the photographer to pursue the same course? To dispose of our products must we absorb the commercial spirit of the shop? On the other hand, can we rely upon our professional dignity for support? To the artistic photographer the petty methods of the bartering salesman are very repugnant, but should he try to deal with the public as an artist he must bear in mind these two facts 1st, the portrait painter's patrons are a very small per cent. of the community. Their yearly number would scarce give the photographer a week's business; 2d, when a photographer makes a practice of furnishing more than one print with his negative he enters the ranks of the manufacturer and gives them a commercial rating more or less dependent upon the value of the raw material and the cost of production, and make it impossible for him to bear the same relation to his patrons that the artist enjoys. Shall we avoid both extremes and keep in the middle of the road? I do not believe in dodging an issue, but I dare not draw the line. This is a serious question and deserves your most serious consideration.

There has been some discussion as to the advisability of uniting the National and the different State associations in such a way as to allow the State two years for convening and the third year for the National alone. This seems at first thought a fair way of disposing of the question of too many conventions, but a further study of the matter has led me to doubt the wisdom of such a step. To give the National but one meeting in three years, would, I fear, mean its final disruption. We need a National Association to give the profession at large stability and character. At Celeron in '96 and again in '97, were gathered together the largest body of photographers that were ever assembled. This, too, during the dullest times that they have ever known. What has aroused this great interest? For several years the State societies have been industriously distributing their leaven. It raised the attendance at Celeron. To interest a man in his local society is to give him a craving to see the greater convention.

The awarding of prizes has been a fruitful theme for discussion, some contending that as many as possible should be given as it brings more entries and produces more interest than any other feature of the meetings. On the other hand there are those who condemn the practice. There can be no question but that there has been a too general distribution of medals in the past. It cheapens their value and takes away the incentive for competition. If every member of this organization came to the meetings with the sole purpose of advancing the interests of the association and of doing his duty at all hazards we would not need to spend money for medals. The sense of duty will never support this association, nor does the association want you to come from a sense of duty. It cannot hope for your support.

A permanent home for our association may appear to you to be a subject that has been worn thread-bare with no tangible results and it is perhaps unwise at this time to take any action in the matter: but I cannot forbear calling your attention to the urgent need of a permanent exhibition room for our Salon collections. We cannot hope to retain these valuable pictures intact unless we provide a place for them. I need not urge their value for public exhibition. It is apparent to all. If Columbus cannot furnish us sufficient wall space for this purpose, I think we had better shake her dust from our feet. The admission of last year's Salon pictures to the spring exhibition of the Cincinnati Museum of Fine Arts, and the very generous notice given them by the press of that city is a public recognition that there is art in photography and to permit this collection to be packed away a possible prey to mice and mildew is a disgrace to the association and an insult to the men who have worked so hard to make our Salon the grand success that it is.

The stand this association has taken in the matter of the higher education is deserving of the heartiest commendation and we take no little pride in the fact that we are acknowledged leaders, and not only do the different State societies look to us for example, but even the National is copying our methods. To those who heard Prof. Beck last year I need urge the importance of the illustrated lecture which is to be delivered this afternoon in this room. Mr. Beck holds that the art of the portrait painter and the art of the photographer are essentially the same and that the best school for the photographer is the modern portrait. We will endeavor to show wherein the photograph of to-day fails to meet the requirements of the artist and tells us how to supply the difficiency.

I sometimes wonder if we fully realize the important part our profession takes in the history of the world's progress. We know, of course, that every branch of science is indebted to photography and that there is probably no line of industry that does not make use of its products.

This is stale news and I might say unwelcome news for this facility of reproduction cheapens our labor and spreads broadcast the impression that we are manufacturers merely. But we play another part that is so important that your calling should be a matter of pride to you all. The advanced civilization of to-day owes its existence to universal dissemination of knowledge. The day laborer who a few hundred years ago knew no pleasures his appetite or his passions did not suggest, is to-day an intelligent citizen with a knowledge of the possibilities of life and an opportunity to enjoy them. If we were to trace the spread of the growing interest in art in the country during the last few years we would stand appalled at its magnitude. Without photography this would not have been possible, and it is to photographers whose productions enter every home that we must look, largely, for the proper direction of this interest. Success in life does not depend upon the amount of one's bank account. The highest pleasures of life are the pleasures of the mind. Many in their pursuit of wealth have no time for these pleasures, but I congratulate you that in every sense of the word the successful photographer is the cultured photographer.

Dundas Todd, of Chicago, gave an interesting talk, congratulating the members, their achievements, and urging them on to a still higher plain. On motion adjourned

Tuesday afternoon, Professor Otto Walter Beck, of the Art Museum, of Cincinnati, delivered an illustrated lecture "Criticism on Photography of To-day." Professor Beck has taken a great interest in the possibilities of photography, and his talks are very instructive. He dealt largely with composition, but touched on other points also.

Tuesday evening, a lantern slide exhibition of Celeron Convention pictures was given.

The Nominating Committee reported as follows:

For President, L. A. Dozer, Bucyrus, Ohio.

For First Vice-President, Geo. Edmondson, Cleveland, Ohio.

For Second Vice-President, L. E. Martindale, St. Mary's, Ohio.

For Secretary, W. K. Van De Grift, Lima, Ohio.

For Treasurer, C. L. Lewis, Toledo, Ohio.

The above ticket was elected. Each officer acknowledged the compliment in a neat speech.

The next meeting place was taken up. Mr. Goddard, of Lorain, proposed Put-In-Bay. Mr. Minns, of Akron, favored the Great Southern Hotel, Columbus, Ohio.

A general discussion followed and was followed by a ballot. The result of which showed Columbus to have 61 votes, Put-In-Bay 7, and Dayton 1.

A motion was made to appoint a committee to prepare a resolution proposing a change in the annual dues of members of the association. Motion was adopted, and I. Benjamin, Geo. Edmondson, and J. N. Appleton were appointed as committee. Adjourned.

Wednesday afternoon, meeting called to order by President. The Secretary read the following list of awards:

Special class, professional photographers outside of the State.

1st Prize.—Gold Medal, C. M. Hayes & Co., Detroit, Mich.

2d " Silver Medal, J. B. Schriever, Emporium, Pa.

Judges.—R. P. Bellsmith, Geo. M. Edmondson, J. M. Appleton.

Special Amateur Class.—

1st Prize.—Gold Medal, Clarence H. White, Newark, Ohio.

2d " Silver Medal, Kate L. Mathew, Pewee Valley, Ky.

3d " Bronze Medal, E. L. Wehrley, Newark, Ohio.

The following classes for residents of Ohio only.

Grand Prize.—Diamond Badge, B. A. Brigden, Cleveland, Ohio.

Class A.—1. Gold Medal, T. C. Osborne, Wooster.

" 2. Silver Medal, C. S. Bateham, Norwalk.

" 3. Bronze Medal, C. H. Lewis, Toledo.

Class B.—1. Silver Medal, R. D. Beem, Greenville.

" 2. Bronze Medal, F. G. Goddard, Lorain.

Class C.—1. Silver Medal, Clara Paeszler, Ada.

" 2. Bronze Medal, H. A. Mowery, Ashland.

Class D.—1. Silver Medal, J. H. Burkholder, Mansfield.

" 1. For Photographic Effect.

" 2. Bronze Medal, F. H. Auld, Columbus. Mr. Auld's exhibit was first in pictorial effects.

Class E.—1. Silver Medal, L. C. Overpeck, Hamilton.

Special mention. Remarkably fine specimens, X-ray Photographs, Dr. L. M. Early, of Columbus, Ohio. Special mention of excellence of exhibits of I. Benjamin, Cincinnati; J. M. Appleton, Dayton; Dozer & McClain, Bucyrus; D. D. Spellman, Springfield; Edmondson & Deeker, Cleveland, and J. R. Wickersham, Urbana, Ohio, none of which were in competition. Judges—C. M. Hayes, Detroit, Mich.; J. Will Kellum, Hazleton, Pa; C. R. Reeves, Anderson, Ind.; F. R. Barrows, Fort Wayne, Ind.; Geo. Halloway, Terra Haute, Ind.

A paper by D. Backrack on "Printing Methods" was next read, and was listened to attentively.

The committee appointed to amend by-laws as to annual dues reported it advisable to leave membership fee as at present, $2.00. Annual dues for proprietors and employers of help, $2.00 per year. Employees, $1.00.

Wednesday night was given over to social entertainment.

The exhibition of photographs in Convention Hall was one of the largest ever shown in the history of the association, there being 76 exhibits in competition, and a number which were shown as complimentary exhibits. The quality of the work shown was also above the average.

The Ohio Salon was, as usual, the principal attraction. Thirty-three pictures were hung in this collection from the numerous exhibits shown.

The Ohio association have reason to be proud of their Salon, and there is a movement on foot whereby the Salon will have a permanent home where pictures can be hung as rapidly as they are selected for this purpose.

The association feel grateful to Messrs. Hollinger & Rockey, of New York, for a half dozen beautiful examples of their portraiture, also to the large number of professional photographers outside of the state who exhibited in the special class. There being some twenty-five exhibits in this class representing the leaders of the profession, the amateurs were also well represented. A large number of beautiful pictures were shown in this division by amateurs from all over the country. The pictorial values in some of the exhibits being grand. The trade was also represented in good numbers. All seemed well pleased with the convention and reported numerous sales. Taken as a whole the convention of 1897 was without a doubt, one of the best and most profitable ever held in the state, and those attending, almost to a man, are loud in their praises of the management and success of the affair.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF AUGUST, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

587,516. Kinetographic Camera. A. Wrench, London, England.

A locking wheel is connected to an intermittently operated feed-wheel, said locking wheel being provided with a series of ratchet-teeth and a notch adjacent each tooth. A single locking pawl is provided with a portion adapted to engage said ratchet-teeth and a tooth for engaging said notches, whereby the pawl will lock the feed-wheel against movement in both directions. Means are provided for disengaging said pawl.

587,527. Kinematographic Lantern or Apparatus. J. W. Hulst, Amsterdam, Netherlands.

A kinematographic lantern is provided with an endless carrier which is supported by a pair of rotary devices, the portions of said carrier between the supporting devices being maintained in a straight line. A series of lenses are carried by said carrier and means are provided for supporting a film in line with the path of said lenses and intermediate of said supporting devices. An illuminating device is located in the rear of said film and means are provided for moving said film and carrier uniformly at the same speed and in the same direction.

587,729. Kinetographic Camera. L. Grubman, New York, N. Y.

In a series photographic device the inventor provides an intermittently operated feed-wheel and means for engaging the film therewith both before and after exposure.

587,991. Photographic Plate Holder. A. Mutschler and J. A. Robertson, Rochester, N. Y.

A sheet-metal front is provided with an exposing aperture and projecting shoulders around three sides forming a slide recess between the front and a rib along the other side. The plate recess is stamped in the back section and is provided with outwardly projecting rounded corners, a partition being extended across said recess. The exposing slide and light-excluding shutter, are located between the partition and the side of the recess.

588,014. Kinetographic Camera. J. Rous, Paris, France.

A chronophotographic apparatus is provided with wheels adapted to draw along a continuous film, said wheels being mounted on a suitable shaft. A notched wheel is also mounted on said shaft, and is engaged by an elbow lever which is operated by a cam upon a rotary spindle. Said spindle is also provided with a projection adapted to engage said notched wheel, whereby the rotary motion of said spindle imparts an intermittent motion to said wheel.

588,597. Photographic Background Carrier. L. C. Overpeck, Hamilton, Ohio.

A movably connected series of parallel rolls is mounted in a suitable framework, said rolls being capable of being unwound at any point and arranged to be brought selectively into position for use. Each roll is provided with a retarding agent. A winding crank is mounted on the frame and a winding spindle connected therewith and adapted to be engaged selectively with said rolls.

588,611. Roll-Holding Camera. P. K. Stern, St. Louis, Mo., assignor to the Stern Manufacturing Co., same place.

A photographic camera is provided with an exposure chamber composed of collapsible walls and hinged rigid walls, a lens being situated at one extremity of said chamber. A receptacle for sensitized material is located in the opposite extremity of said chamber, and a rigid wall is located adjacent said receptacle and hinged thereto, the chamber being adapted to collapse upon the angular approach of said receptacle and rigid wall.

588,790. Method of and apparatus for packing photographic films. T. H. Blair, Northborough, Mass., and S. E. Waterman, Pawtucket, R. I., assignors by mesne assignments to the American Camera Manufacturing Co., Northborough, Mass.

This improved process consists in feeding the composition which forms the base of the film onto a moving surface which draws it into a thin strip, carrying the strip over suitably constructed and arranged guides while it becomes seasoned, conducting the strip into a dark room and passing it through a sensitive emulsion.

588,916 Kinetoscope. W. G. Steward and E. F. Frost, Washington, D. C.

The inventors claim the method of directing light rays consisting in causing the rays of light from a series of moving objects, each to be held stationary through a given point.

589,055. Stereoscope. H. C. White, North Bennington, Vt.

A shaft having a broadened end is attached to a lens frame, and a hood, which is also fastened to the latter, forms a dark chamber before the eyes, said shaft and hood being formed with beveled edges which fit together without overlapping, the hood being substantially flush on the underside with the end of the shaft.

589,168. Kinetographic Camera. T. A. Edison, Llewellyn Park, N. J.

This invention is described by the inventor as being an apparatus for effecting by photography a representation suitable for reproduction of a scene including a moving object or objects, and comprises means for intermittently projecting at such rapid rate as to result in persistence of vision images of successive positions of the object or objects in motion, as observed from a fixed and single point of view, a sensitized tape-like film, and means for so moving the film as to cause the successive images to be received thereon separately and in a single line sequence.

589,260. Embossing Photographs. D. F. Hulbert, St. Louis, Mo., assignor to the Hulbert Bas Relief Co., the same.

This is an apparatus or die for embossing photographs and comprises an embossing die or form consisting of a malleable metal plate having a picture or design upon one of its sides, said plate being embossed to form a pattern. Said pattern is outlined or indicated by said picture or design, and said plate is backed by a mass of hardened plastic material. An embossing die or form consisting of a malleable metal plate is adapted to be pressed firmly against the first mentioned malleable metal plate and backed by a mass of hardened plastic material.

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Vol. XXIX.
FOUR DOLLARS PER ANNUM.

NOVEMBER, 1897.

Number 11.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.



THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH ST. NEW YORK.

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THE PHOTOGRAPHIC TIMES.

VOL. XXIX. NOVEMBER, 1897. No. 11.

AUTOBIOGRAPHICAL SKETCHES.

CHAPTER V.

BY H. P. ROBINSON.

"When fortune means to man most good
She looks upon him with a threatening eye."—SHAKESPEARE.



THE PARADE, LEAMINGTON.

AT THE beginning of 1857 professional establishments were rapidly increasing in London, and more slowly in the country. In London the studio was at the top of the house, in the country in the garden; both were approached through a hall or passage in which were the show-cases. I cannot remember any photographer at that time who thought it necessary to make the splendid shop-window displays one now sees; paper pictures were the exception rather than the rule, and the evolution of portraiture was in the collodion positive stage.

It must be remembered that all this time I had little or no more money than was required for ordinary needs, and a house could not be taken or a studio built, nor furniture and apparatus bought without money. Worse than all, my friends thought me mad to give up a good business for what was looked upon as a very doubtful method of making a living. One friend would lend me a large sum to go into any other business, but not a penny towards photography; but, to shorten this part of this little history, one of my old Ludlow patrons heard of my difficulty, and quite unexpectedly lent me £100, very much less than it would be thought possible to do with under the same conditions nowadays Now began the only real business struggle I ever had in my life, and it was fierce while it lasted. Perhaps I should not have the courage to refer to it, if I did not think the contemplation of my misfortunes and how they ended, may revive hope in those who may have the mishap to meet with similar difficulties. It is surely good for all of us that we should not have it all our own way from birth to death.

I was not badly equipped, except with cash, for going into business. I knew something of business methods to begin with, and by this time I had had more or less practice in most of the graphic arts: oil and water-color painting, scene painting, miniature painting, pastel, chalk and pencil drawing, wood engraving, etching, aquatint, mezzotint, and lithography, and nearly all the processes of photography then invented, and was able to look at the press processes from the printer's practical point of view, in addition to energy that it appals me to remember, and my wife still occasionally reminds me that I told her gravely when we were married, that it must be "photography first, wife afterwards!"

On the strength of that hundred pounds and a very little more I had saved, I took a house in the best part of the Parade at Leamington at £80 a year, built a studio in the garden, and opened the show on January 12th, 1857. We made but a meagre display, a few poor portraits taken out of doors, and some local views, but

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the portraits were a novelty, nothing had been seen like them in the town before; there was only one other professional and he did nothing but positives on glass.' Many people came to look at the show from the outside, but nobody came in, except intimate friends, for a week. At last, we had some genuine sitters. A lady and her two daughters came for a whole plate group. And now a strange thing happened to me. I was struck with what I can only call studio fright. I was "sitter shy." I could not face them. I ran away and took some time to recover my nerves. However, after a time I pulled myself together and managed to succeed in making a satisfactory group. This indicated a difficulty I had to study and correct, and it has not troubled me much since, although, even of late years, I meet at rare intervals with sitters I feel I would give the world to avoid, but have only once given up a sitter because I didn't like his looks, although I have turned out several for not conforming to the rule that no smoking was allowed, and for too exuberant spirits.

From the time I had commenced experimenting I had never had much difficulty with the process, but I had had no experience in the winter. Soon after I commenced, however, I met with all sorts of difficulties, chiefly from cold. Then came a great frost. The studio was attempted to be heated by a coke stove, which caused its own faults. Baths froze, bottles burst, collodion would not work or was very slow when prepared in a nitrate of silver bath near freezing point. One day I had an important sitter (it was Mr. John Laird, the famous ship-builder of Birkenhead), coming for an expensive colored portrait. The studio was dreadfully cold, and I piled up the fire and was called away. On my return I found the whole place on fire. The cocoanut matting of the floor and the wooden platform was burnt out; fortunately there was not much furniture to burn, and the camera escaped with a scorching. The fire was soon got under, but in putting it out we converted the studio into a beautiful grotto of icicles which was not helpful to photography. However, we soon got things to rights, but I obtained a good negative of Mr. Laird, who was one of my earliest and best patrons, and I had the pleasure of telling him some years afterwards that the good order from the negative had, probably, saved the whole concern.

In March of this first year I did three pictures for exhibition. They were of a theatrical subject, "Mr. Werner as Richelieu"; and were exhibited at the Manchester Art Treasures Exhibition, one of the finest exhibitions of painting that has ever been seen in this country It was in this exhibition that Rejlander's "Two Ways of Life" was first seen. My Richelieu was desperately bad. If we are to believe in his costume as shown in the photograph, the Cardinal dressed in crochet work antimacassars. I have a copy before me as I write. Before the end of the year I had produced a little picture of "Juliet with the Poison" that pleased me much better, and was the first of a series of whole plate pictures that were in the exhibitions for two or three years.

One of the difficulties of photography in early collodion days was getting any two samples of material to act alike. Collodion was peculiarly liable to depart from uniformity. It was difficult to obtain a collodion that would give a vigorous image, then it was decided by the chemists that their aim should be a collodion that would develop in the high-lights "as black as your hat, sir." It was useless for an artist to protest that he would prefer soft pictures, what did he know about it, did he invent photography? This idea was unfortunately fostered by the greatest chemist who occupied himself with the art, J. F. Hardwich. He advocated the use of iodized-collodion to the exclusion of bromide, and thereby got dense negatives. Photographers had to believe and follow the greatest authorities in those days; they were not allowed to have a will of their own. This was particularly the case with the camera makers, who insisted in using the heaviest materials, and solid workmanship, Spanish mahogany for cameras and strong oak for printing frames. About this time I had some 18 x 16 printing frames made of pine, by a common carpenter, and some of oak by the best maker. They are all in use at the present time, and those made of pine are in the best condition, and by far the most convenient to use.

The weight and inconvenience of the wet process for landscape work were so enormous that the photographic world for years before and after this date was hard at work endeavoring to invent dry processes that could enable the operator to get rid of the incumbrance. The dry processes were to the photographer of the day what the developer was to those of a few years ago, everybody had got a brand new one, or a modification of an old one.

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I, of course, did as others did. I greatly simplified the Collodion Albumen Process, and wrote a paper on the subject which was published in the journal of the society, my first appearance in a photographic paper. I also published a guinea book entitled "Warwickshire Illustrated, a History of Remarkable Places in the County of Warwick," illustrated by a series of photographic views, by the Collodion Albumen Process. There was an astonishing two column laudatory review of the book in the *Athenæum*, (which journal has taken it out of me occasionally since), and it rather more than paid expenses. The views could not be said to be as good as they would have been by the wet process, and a year afterwards, when things were looking up, I started a pony and van with the aid of which I secured a fine collection of negatives of the lovely scenery around Leamington, Warwick, Kenilworth and Stratford on-Avon, and all within reach.



RED RIDING HOOD BY H. P. ROBINSON

During this first year sitters were few and far between, and for one month during the best of the season not one came near us. We struggled on, however, by the help of local views, and stereoscopic slides. In the spring of 1858 I considered the case hopeless and advertised the business for sale. Several people came to see it, but nobody would buy, although I was ready to almost give it away so that I could get rid of the responsibility. In April after some preliminary studies I took the negatives of "Fading Away," and after two months' work at them succeeded in getting a good print. This picture was produced with materials of my own preparation, from the collodion and nitrate of silver to the albumenized paper and chloride of gold. I should not be ashamed of the manipulation now, and the three copies I still possess are as perfect and fresh as they were thirty-nine years ago. Fading came in with a desire for more glaze. Albumen had to be sophisticated to satisfy the demand, the result we all know.

The production of this picture had a surprising effect on my fortunes. For two or three years Dr. Diamond had introduced me to his friends (he was a bit of a humorist) as the "coming photographer;" this was always taken as a joke, but this picture seemed to confirm the semi-prophesy. A copy was shown at the doctor's house, and his numerous, literary, and artistic friends were as much surprised as the present *Daily Chronicle* critic would be at any photograph that would compel him to confess that it was a work of art. The difference between then and now was that there was not so much ignorance, real or pretended, as we have now. Everybody admitted that a picture, in whatever material that could play on the emotions and draw tears, must be a work of art. The picture was first shown at a dinner at "Our Club" (a club instituted by Douglas Jerrold)

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and noticed by Shadbolt in the *Liverpool Photographic Journal* (now the *British*) of June 15th, 1858. The exhibition of the Photographic Society was about to open, and I took a copy there, but was a day too day late. The secretary of the time was an unsympathetic chemist (afterwards a famous savant), and all he could see in the picture was what he thought was a join, an imaginary enormity which afforded a text on which he waxed eloquent. He rejected the picture on the ground that it was too late. This was a valuable lesson to me. During the following thirty years I have saved many a photographer, and to some extent the society, from the horrors of red tape.

The picture was first seen publicly at the Crystal Palace in the autumn, and immediately afterwards at the Leeds Exhibition in connection with the British Association.

Being personally interested, and taking to my assistance all the assurance and forgetfulness of modesty that goes to the writing of an autobiography, I find it impossible to give any adequate impression of the reception of "Fading away" by the public. I have a large volume of newspaper cuttings, as well as many very painful letters and long poems from families who were losing one of their number, for the dying girl seem to be like every other young girl dying of consumption in the country. Then people came to Leamington to see the model, and were disappointed as much as I could make them. But in one case I weakly yielded to the urgent entreaties of Countess S——, and took the little girl to London to be interviewed. I am sure this was a great mistake, the disillusion was unmistakable.

It is a great indiscretion for a photographer to show his model, his scenery, or his methods. He may be very proud of the power of dressing and talking to and posing a healthy girl of eleven or twelve until she looks like a dying girl of twenty, he may make a heap of earth and a few stones in a back garden look like the top of a mountain, he may throw the glamor of light and shade equal to Rembrandt's over his group, but he gives himself away body and soul if he takes credit for them. Better to be content with the applause he is sure to get for the completed work, rather than expose all the mean little dodges that go towards building up a complete whole that shows not only nature, but that nature has been filtered through the brain and fingers of an artist. Towards the end of this eventful year I produced a series of pictures of the story of Red Riding Hood which was not unsuccessful. Here is one of them. Notwithstanding the fame that "Fading Away" had brought me away from home, I did not notice that it had made any effect in Leamington. I don't think at the time it added a single sitter to the business, but it brought me many friends; among others at that time I became acquainted with the Rev. E. Bradley, Cuthbert Bede, author of that wonderfully popular book, "Verdant Green," which had the largest sale of any book of the time. I have a large number of his most interesting letters, and give an extract from one of them that may be of interest to portraitists as well as writers.

"By this post, I send, you my "Verdant Green," in which I have written your name, and which I hope you will accept. The likeness is no likeness at all, although done from a very good photograph by Mr. Rejlander. But it was drawn on the wood by John Gilbert, who is too great a genius to descend to the mechanism of copying. A new edition of "Verdant Green" was published last month, so it still sells! I believe that the sale of the complete edition is more than 100,000. The sale of Part I was much larger. Unfortunately I do not gain by it. In fact I have to purchase copies of the work, and the bookseller who hands me the books across the counter receives out of the 3s 6d. one shilling for his trouble—the author *Nil*. Such is life, and such is authorship."

I also became acquainted with two artists who did much for me in the after time, a sculptor and a painter, Alexander Munro and Henry Moore, afterwards R. A. Munro was a sculptor who, for grace and poetic feeling, had few equals among his brethren of the chisel; it was in his London studio during rare visits that I made the acquaintance of many of the young and promising painters, especially the pre-Raphaelite brethren. He died in 1871 when he might be still called a young man, and I lost touch of my connection with the renaissance of English art for a time. I must not forget, however, one of the most lively of our young painters, now a grave R. A. and, I think, a churchwarden and a town councillor also, who spent the summer of 1859 at Warwick, and of whose buoyancy of spirits and jovial gaiety I saw a good deal.

Outside of my family Henry Moore was my nearest and dearest friend up to the day of his death, two years ago, following that of his

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MY PHOTOGRAPHIC VAN

brother, the well-known Albert Moore. The influence for good of such constant friends may easily be appreciated.

Badly as we were doing at home I still saw something of the world. I never wished to push myself into the society of celebrated people, but I plead guilty to the curiosity that likes to see them, and I was often much surprized at the goodness of people much older than myself, for whom my society could have no kind of attraction. I still continued to run up to London occasionally to Dr. Diamond, and keep up the acquaintance of many kind friends I had made there; among them I have met David Livingstone and his brother, Chief Baron Pollock, Joseph Durham, A. R. A., Hepworth Dixon, Dr. Percy, Robert Hunt, Roger Fenton, P. H. Delamotte, and nearly all those whose names are historical in connection with early photography, as well as many others connected with literature and art, very few of whom, alas, now remain with us.

PREPARING NEGATIVES FOR SLIDE MAKING. BY ELLERSLIE WALLACE.

THERE is surely no pleasanter work than to make slides from perfect negatives? But it almost goes without saying that we cannot always count upon the good fortune of having them

Supposing the negative to be varnished, it is not a difficult matter to touch out transparent specks and pinholes in any of the high lights. A neat dab of opaque color from the tip of a fine hair pencil settles it. But when the specks come in a mass of delicate half tone like clouds or distance, it is not so easy. I prefer to treat these with a medium-hard lead-pencil, sharp pointed, after first applying a drop of mixed Canada balsam and turpentine to the varnished surface, and then rubbing off with a tuft of cotton. This gives an excellent "tooth" for the pencil, and the transparent spot may then be worked at with numerous gentle punches with the point. The amount of deposit thus added is not great; so that it suits well on the lighter half tones, if only the work be neatly done, and *it must be*. In order to succeed, the negative should be supported on a retouching desk in a good light, and a magnifying-glass, not less than four inches in diameter, be interposed on the left side. It is a good plan, too, to use a card somewhat larger than the negative, having a hole cut in it, say the size of a dollar or less, so as to shield the eye from all light except that on the portion being worked at. It may happen that the pencil-work will cover the outer parts of a transparent spot very well, but leave a small speck right in the center that will still print through; in such a case it is better to apply liquid color with the brush point than to go over the pencilled work again in the hope of increasing the density. Of course these hints apply to any regular retouching on the surface that may be desired—and a great deal can be effected by a neat artistic hand.

I have gotten good results out of imperfect negatives in slide-making by the old method of covering the back with tracing paper, and then working up thin skies or weak shadows with the artist's stump and blacklead. Paper of fine texture can be found that will not leave any perceptible granularity on the picture when it appears on the screen, and there is certainly no way equal to it for forcing out detail in shadow that is visible, but too weak to print, and that extends over large portions of the picture. With this it is also possible to apply varnish or oil over solarized parts, so as to make the paper more transparent, and let the light get through. In architectural work, much good may thus be done with plates that have been exposed in a bad light, which gives feeble detail in the shadows and solarizes all such objects as towers, spires, tops of trees, etc., etc.

Supposing a negative, perfect otherwise, to show a thin sky from uneven coating, I prefer not to treat it at all, but during the exposure of the slide to shield the sky with a piece of dark thick paper roughly cut to follow the sky-outline. The sky of the slide will then come out quite clean.

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We frequently have to deal with negatives that have been made in hand cameras, and show distortion of vertical lines. In slide making, this can be rectified by putting the negative in a camera with an ordinary swing-back, and keeping the sensitive plate vertical, using the swing as judgment dictates. If this is found to interfere with ease of obtaining sharp definition, some other lens should be tried, and after focusing, well stopped down.

If the image on the negative is merely "askew," a little adjustment before making the slide is all that is required. Cameras are now made with a convenient apparatus for effecting such changes in position. My remarks are intended to apply to slides made with the camera. If made by contact, the paper covering would be troublesome, but might succeed in diffused daylight. I merely give the results of my own experience.



THE CHRISTMAS TREE BY T. TROWBRIDGE

PHOTOGRAPHIC CHRISTMAS PRESENTS. BY F. J. BURNETT.

However much one may enjoy the giving of Christmas presents, the selecting of those that will be appropriate and acceptable, and at the same time come within the limits that the dimensions of one's purse puts upon his generosity is, to most people, something of a task. It seems as if it might be a very easy matter for him whose plethoric pocket-book permits the scattering of '98 model wheels or "Henry Clay's" among his friends and kindred, but the ordinary mortal is oftentimes sorely tried to know *what* to give this one or that one whom he wishes to remember, and this tax on his gray matter reconciles him to the fact that "Christmas comes but once a year."

To the owner of a camera, however, the coming of Christmas with its attendant duties and responsibilities should be devoid of terrors, for he has the means at hand of evolving presents to fit all sorts and conditions of men and women. A little ingenuity will enable him to get up something that will give more delight to those of his sisters and his cousins and his aunts who have passed the pinafore age than almost anything he could *buy*.

A single ordinary silver print neatly mounted, makes a beautiful Christmas card, and one can add a verse or a sentiment with a pen on the margin or back of the mount, after the manner of machine-made Christmas cards, thus making it more apparent that it is not merely a photograph, but a photographic Christmas card.

Blue prints from negatives with strong contrasts, on good blue paper that will give clear whites, by slightly under-printing and mounting on white mounts, can be made to look like the Delft things that are so popular. The best subjects for this sort of thing are waterscapes, of course, being more Delftlike, but I have made excellent ones from a bit of railroad track, the main point being to have an abundance of high lights with a few streaks and patches of deep shadow. The bevel-edged cards that are sold at picture stores, for artistic maidens to paint blue poppies and pink sunflowers on, make excellent mounts for this sort of Christmas card, and quite a variety can be made from a few negatives by using mounts of various sorts, and making prints different shapes, and the variety may be increased by using other mediums, as carbon or platinum. It is no disparagement to the productions of Prang or Tuck to say that any sane person would rather have one of these home-made cards than any lithographed one.

Very pretty bookmarks can be made by mounting small prints or slices from large ones on ribbon of suitable length and color; and when one first tries it, it is surprising how many little pictures can be cut from larger ones for this purpose.

By covering the advertisement on a calendar with a print, or by detaching the calendar proper from its advertising back, and making a new back for it with a photographic decoration, another sort of present is made. Another sort can be made by squeegeeing gelatine prints

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PORTRAIT STUDY

BY HOLLINGER & ROCKEY

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on spoiled plates, which of course must be previously cleaned. They may have cardboard pasted on their backs and a leg attached to make them stand up, or, with no backing whatever may be set on an easel, and will look far prettier than one would at first suppose. Instead of old plates the prints may be squeegeed on the glass from photograph frames that are to be found in picture stores, which can then be returned to their frames, and you have a framed picture.

A very pretty album can be made by mounting prints on rather thin mounts considerably larger than the prints, and binding by means of a ribbon tied through small holes, in a cover of heavy rough paper. The writer once designed and constructed one with the aid of one of his obliging kindred. The prints were from 5 x 8 negatives, mounted on 8 x 10 white cardboard; the cover water color board, in one piece, covering the back. We made the holes for the ribbon fastening with an eyelet punch, such as is used for binding legal papers, but if this is not accessible a common punch that can be bought for a few cents at any hardware store, and a hammer, will do the work as well.

Before binding we looked up a verse or a few lines of poetry to fit each print; for example, these lines from Sidney Lanier's "Hymns of the Marshes":

> "And look where a passionate shiver
> Expectant is bending the blades
> Of the marsh-grass in serial shimmers and shades,"

for a bit of wind-blown marsh, and with French gold paint and India ink lettered it on the back of the mount of the preceding picture, so that when bound each verse would face its proper print.

Our subjects were suburban studies, bits of woodland and river, of meadow and marsh. The same idea is capable of considerable variation; a series of snap shots in the streets of your own city would be interesting and acceptable to any former resident, or to one interested in the place because *you* live there, or, if it be an important place, to anyone. A collection of corners of your own rooms with the furniture and belongings you use every day, and bits of your garden, would mightily please some of your kindred who cannot see these things every day. It will not require a very great waste of brain tissue for any camerist to make a number of such albums from negatives already on hand, and each year's exposures should supply the needs of each Chirstmas.

If one can string words together fairly well, it is an easy matter to make little booklets of type-written text and photographic illustrations, writing up some outing or journey, or merely explanatory notes of the pictures used. If tolerably heavy paper is used the same will answer for type-writing and mounts, if the prints are not over large, and then the sheets can be bound with any of the different devices for binding legal papers or pamphlets. Or one can find a poem that admits of easy and profuse illustration, like Mrs. Dorr's "Fallow Field," or the song of the brook in Tennyson's "The Brook," and typewrite or engross with a pen, a stanza on a page with an illustration for and facing each stanza, and make into the same sort of a booklet.

The giver of presents of this sort can have the satisfaction of knowing that his gifts are absolutely unique; that those to whom he sends them cannot already have the same thing, and that there is no danger of their receiving a duplicate from anyone else, which is something the giver of purchased presents cannot always know, and which is sometimes a great comfort after one's packages have been surrendered to Uncle Sam or the express companies or the A. D. T.



STUDY BY F. H. DAY

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FACIAL EXPRESSIONS IN PHOTOS—AN INTERVIEW WITH OTTO SARONY.

BY GILSON WILLETS.



RESIGNATION.

THE laity often passes judgment upon a photograph by saying: 'Why this doesn't look like our friend. It doesn't do him justice. The face might be of stone. It is totally devoid of expression.' In nine out of ten such photos the blame can be traced, not to the subject but to the photographer. Merely to photograph the human face, is not enough. There should be an indication of soul. Any ordinary draughtsman can draw a face, but the artist transfers to his canvas, not only face, but soul. Soul is just as important in a photograph as in a valuable painting. Only soul in a photograph is called facial expression."

The speaker is Mr. Otto Sarony, otherwise known as Sarony the Younger; the place, Sarony Gallery. Mr. Sarony is naturally a very reticent man. But show him that you are earnestly interested in photography and he will talk freely. Visiting photographers would do well to call uponhim. In a little chat he can say a great deal about photography as a profession, give many new ideas and practicable hints not found in books.

"The value of facial expession in photographs," he continued, "cannot be over-esti mated. Unless a photograph contains that mobility of countenance which, on the instant, indicates the inward workings of emotion, it never does the subject justice. The eye has been called the window of the soul. It works in perfect and immediate accord with what the heart feels. It speaks more quickly, and frequently with greater eloquence, than the voice. But important as the eye is, the play of facial muscles is equally necessary if expression is to obtained.



COQUETRY

N. B.—With photographs of Minnie Maddern Fiske, showing the possibilities of "Facial Expressions" in portrait photography. Photos taken by Sarony for the *New York World*.

"But how is the photographer to secure eloquence of eye and the play of the facial muscles? Suppose the subject poses before the camera in agonized self-consciousness. What if the subject presents a blank unmeaning stare, gazing at a given object like a face of stone? How can facial expression enter in the photograph of a person whose face is naturally expressionless?



POSITIVE ASSURANCE.

"I will answer the last question first. A naturally expressionless face means, usually, one which is expressionless in repose. Such a subject should be studied carefully by the photographer. Where is the weak point in the subject's make-up? In what does he joy? In what does he grieve? In what does he become interested, enthusiastic, hopeful, and so on? There is always at least some one thing in which a person is interested; over which he will brighten up, in the cause of which his soul will become animated and manifest itself in facial expression. Find this one thing. This will be the one moment in which the subject will appear at his best. The photographer must take the picture in that particular moment. When the novelist, Wilkie Collins, came to our studio, he sat before the camera with a face absolutely expressionless. 'This will never do,' said my father, who then proceeded to engage the novelist in conversation. Suddenly he discovered a peculiarity of facial expression which was most interesting. It was while Mr. Collins was speaking of his favorite book 'The Woman in White.' At that moment my father made a quick exposure, feeling that he had taken the novelist at his best. And so



ROGUISH RECOLLECTION.



PATHETIC SOLICITUDE.

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it proved. When Mr. Collins returned to England he wrote back: 'You have taken a photograph with a soul in it. Those taken over here lack expression in the face. They are libels. But I feel like giving your pictures to all my friends.'



ANXIOUS SELF INQUIRY.

"In somewhat the same way the photographer should study and manœuvre with the subject who looks at a given object with a blank, stony stare.

"James G. Blaine sat here one day with exactly that kind of a stare. To my father who was to take his picture the situation seemed hopeless. But presently, remembering that Mr. Blaine was a great story-teller, my father cracked some sort of a joke at which Mr. Blaine smiled and began, in his calm way, telling one of his own stories. 'And now are you ready to take my picture?' he said, when he had finished the story. 'It is taken,' replied my father. He had caught Mr. Blaine at the right moment, just as he was reaching the story's climax, and that photograph was the best ever taken of the great statesman. It was one of the few in which soul manifested itself in that face which, in repose, was so like stone.



ANGUISH OF CONFESSION.

"I suppose this sort of a picture might be called a snap-shot. But it is the sort of snap-shot made successful by previous study of the subject. But the photographer who risks an instantaneous picture when the subject is unaware, must already have studied his subject; should be familiar with his habits and surroundings, and, as has been said, know the crucial moment in which he appears at his best. It is evident that some people can be made to have facial expression in a photograph only by means of a snap-shot But the game must be bagged by a sharp shooter. The game cannot be bagged by a slouchy sportsman.



FATALISTIC RETROSPECTION.

"But the most difficult subjects, and the most numerous, are the self-conscious—those who sit before the camera and in the attempt to pose, succeed only in obtaining awkwardness of body and a facial expression signifying torture and agony. A conscious person should never be told to 'look pleasant' or natural; for thereupon, his lips will spread in a ghastly smile, and he will look thoroughly miserable and unnatural. Self-consciousness is always sure to affect a photograph the wrong way. This is the reason that Chauncey Depew has never had a picture taken that does him justice. The photographer has yet to be found who can make Dr. Depew look unconscious while the camera is trained upon him. He never looks natural. If he could be caught unaware during a political speech, or when reaching the point of an after-dinner story, he could then see himself, in a photograph, as he really is.



FEAR AND HOPE

"Another essential in securing facial expression is harmony between photographer and sitter. The silent, magnetic chord must be struck. This accounts for the great difference between the first and the last photographs which I took of Grover Cleveland. When he first came to sit for me, he was cold and indifferent. Accordingly his photographs were expressionless, his face was a blank, soul was wanting. Not so the last ones, however; for on this occasion he grabbed my hand cordially and talked with warmth and spirit. At last we were friends, harmony was established, and the photographs taken that day show his friendliness and fullness of soul.



FRATERNAL CONCERN.

"Another important consideration in photographing the self-conscious, is to be alone with the sitter. Clear the room. Allow no third

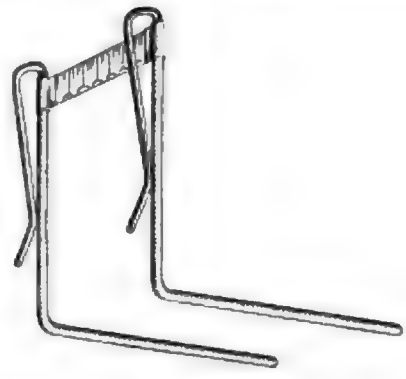
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person in it, or even within hearing. When Minnie Maddern Fiske came here to sit for the photographs showing the various facial expressions used in acting the part of 'Tess of the D'Urbervilles' she refused to allow any one to remain in the room but myself. 'If there is an outsider present,' she said, 'I shall become conscious, soul will leave my face, and I will not get the pictures I want. Leave me by myself and I will think over the various scenes, and when I get myself into the right mental condition the correct facial expression will come.'

"Stage folks are, of course, most amenable to the camera. Facial expression and posing, with them, is a business. Their photographs almost always convey the existence of soul, in that they contain natural facial expression. Pose of body and face in the case of actresses, is usually artistic. And that is the reason photographers who take the 'profession' are so often cross-examined by private individuals. 'Why don't you take me like Ellen Terry, or like this or that actress,' they ask. 'I am just as handsome, I have just as good a figure, my gowns are made by Worth, and my bonnets by this or that fashionable milliner. Now why don't you make as good photographs of me as you do of Terry, Rehan, Bernhardt, and so on?' Now, the reason why, is obvious. For neither a beautiful face and handsome figure, nor even a Worth gown and a fashionable bonnet can give the natural facial expression which in a photograph makes the soul manifest."

FILMS THAT WON'T CURL, SIMPLY BECAUSE THEY CAN'T. BY OTTOMAR JARECKI.

It is too good a thing to hope for, that the average roll film you come across is going to lie flat and limp as per program. Even if the old-time thin variety were restored to us—and why we have to do without it, who knows?—there is age and long confinement in close coils that give films a very kinky and contagious temper. The first attempt to remedy this defect as far as comfort in development was concerned, was to make use of the old fashioned wooden spring clothes pins. These were clamped to the tray rim, having been provided with angle shaped brass wires extending into the dish, under which the ends of the films were slipped. Incidentally, this tray was of tin, flowed over with melted paraffine and made to hold two strips of three exposures each, of the popular 3½ x 3½ size The pan measures 8½ by 12 inside at the bottom, with flaring sides and a rim 1¾ in. deep. Later, a wire clamp was devised independent of the clothes pins, and of this a sample has been sent



to the editor for illustration, and this will explain the idea fully. Size will suggest itself. Four sets of clamps were attached to the dish, and the wires had thin rubber tubing slipped over them to prevent metal contamination. This small tubing is used for insulation purposes by electricians. This keeps the film perfectly flat, and to guard against another difficulty, that of the films sliding upon each other, a somewhat similar single clamp was set in the rim between the other two at each end of the dish. It will have occurred to the reader that this method does not encourage the wholesale development of numerous cut films, face down in one dish, as the inevitable damage to the surface is too aggravating to be tolerated by careful workers. On the other hand, not every one is in position to rig up the Ferris Wheel style of developing a whole uncut roll in one strip.

The fixing dish is similarly equipped, leaving off the dividing clamp, and it is just solid comfort to know that when a film is fixed, it is fixed all over and for good, without white patches showing at the final round up.

The soaking dish after fixing is arranged differently. Two stout brass wires are taken, bent somewhat in the shape of the cross-section of the dish, only skimped half an inch or more in length and depth. This pair is laid across the dish lengthwise and the films, two to the dish, are slipped under the suspended wires face down. The curl of the film keeps it off the bottom and thus in the best position to soak out the heavy hypo solution, and have it sink to

the bottom of the dish. For fixing, a domestic granite ware dish was cheaply procured, of dimensions 10 x 15 inches, outside measure.

A system of continuous working can be planned, so that while one pair is washing, another is fixing, and the third is being developed. When development is complete, each pair is advanced one stage, and the pair in soak is dropped into a pailful of water, there to remain until the final rinsing and glycerining.

If anything in the above should not appear perfectly clear to anyone wishing to experiment with the above devices, I shall be glad to answer any questions through the mails.



A TEA PARTY BY C. F. JENKINS

THE DAGUERREOTYPE. By CHARLES L. LOCHMAN.

It was in the year 1839, when the discovery of Daguerre, known as the Daguerreotype process, for making pictures with the camera obscura by the chemical agency of light was given to the world. No discovery for the last sixty years has caused such a universal sensation in both the old and new world, as well among the scientists as among the masses, who were astonished at the seeming magical manner in which likenesses could be taken. Although the process is no longer carried out, I consider the Daguerreotype the finest and most permanent heliographic picture that was ever made. It is unequaled for microscopic detail, modulation of shade and delicacy of half-tone.

The material constituting the picture, under ordinary circumstances, is absolutely unchangeable. I have in my possession pictures made fifty years ago which are as clear and perfect as on the day they were taken. There is no photographic picture that yields as fine a copy as a Daguerreotype. The best way in taking a copy, to avoid reflection, is to let the sun's rays fall upon it at an angle of about 45 deg. In some cases there may be a slight scum on the surface, from insufficient washing, which may be removed by means of a fresh solution of sodium hyposulphite. By no means use a soda bath in which prints or negatives have been cleared, or you will ruin the picture by a deposit of silver on the surface.

I would not be surprised if some enterprising photographer in the near future would announce that he is now prepared to make the long neglected but beautiful Daguerreotype picture, unrivalled for permanency and delicacy of shading. The pioneers in this beautiful art who have been permitted by kind Providence to see the wonderful application of photography to every department of human knowledge and refinement of life, are but few in number, and a brief account of the Daguerreotype process may be interesting to the younger photographers. Your firm, Mr. Editor, were then as alert as they are now in supplying everything necessary in photography, with all the requirements in making the Daguerreotype. They were the first, and, I believe, the only ones in this country that rolled the silver plate, stiffened with a backing of copper, on which the Daguerreotype picture was made.

Detail of the Process.—The silver plate being highly polished with rotten stone and by buffing with jeweler's rouge, is sensitized as follows: Two boxes are employed, the construction of which is shown in Fig. 1.

The wooden box, A, contains a rectangular glass vessel of similar shape, with the top edges ground evenly, so that when not in use it is covered with the ground glass plate, the edge of which is shown at D, cemented to the lower surface of the sliding lid, B. The box is also provided with a loose top, which is pressed down with a screw, supported on a cross-beam (which are not shown in the cut), to keep the box tightly closed, and under which the sliding lid moves.

In one box of ordinary size is placed about

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half an ounce of iodine on bibulous paper; in the other box, called the "quick" box, similar in construction but not quite so deep, is placed a mixture of bromine and slaked lime (about 1 to 30) to the depth of an inch. The lime prevents the too rapid volatilization of the bromine. Some used a liquid quick, 1 ounce of bromine added to 1 quart of lime water.

In sensitizing the plate it is laid face downward on the rabbets of the opening C, the lid being first pushed out, and then slid back over

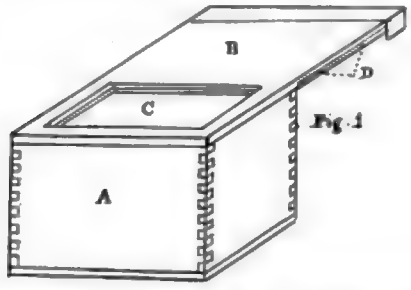


Fig. 1

the glass vessel containing the iodine, and left until it has acquired a deep yellow color, which requires from part of a minute to several minutes, depending upon the temperature of the room. The plate is examined from time to time in a dimly lighted room as to its color. It is now removed and similarly exposed over the bromine, in the "quick" box, until it assumes a bluish steel, or plum color. This is the most critical performance. If exposed too long or too short a time, no impression could be made on the plate, or but a very slight one. It depends altogether upon the temperature, and strength of the "quick." In a very warm room the time may be only a second, while in a cold room it may require several minutes.*

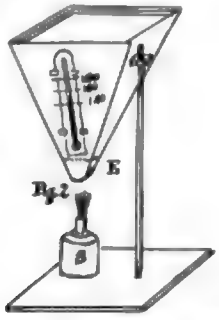


Fig. 2

The plate is again exposed a second time over the iodine, half the time of the first exposure. It is now ready to be exposed in the camera, precisely as with a dry plate, and requiring about the same time as a slow dry plate. It is now developed by being exposed to the vapor of mercury (one or two ounces) contained in an iron vessel, shown in Fig. 2, and heated by means of a spirit lamp, S, to a temperature between 140 and 180 deg. F., until the details are all out in the darker parts. It may require from a few minutes to a quarter of an hour, being occasionally examined in a feeble light. The next step is the removal of the iodine and bromine by means of a solution of sodium hyposulphite, and after being washed in a stream of water for a minute, it is subjected to the gilding process by means of a solution of hyposulphite of gold, prepared by pouring a solution of 15 grains of terchloride of gold in a pint of distilled water into a solution of 60 grains of sodium hyposulphite dissolved also in a pint of water. This solution is poured on the plate while being held perfectly level with a pair of pincers, or on a leveling stand, and heated to boiling, or until the picture comes up brilliantly. After being washed for a few minutes under a tap of water, it is dried with a spirit lamp and put in an appropriate case.

The most remarkable in the process of Daguerreotypy is the development with the vapors of mercury. Was it accidental, as it has been asserted, by throwing an exposed plate in a box of rubbish which contained mercury, or was it by one of those unexplained, psychological influences which sometimes induce an experimenter to make use of means which in ordinary reasoning would be most unlikely to lead to desired results.


CROSSING THE BROOK BY ALFRED CLEMENTS

TECHNICAL KNOWLEDGE: ITS VALUE TO CRITICS.—Harry Quilter, in his well-known work on "Art," makes the following remark, which every photographer will do well to ponder: "I have given some years of my life to the study of pictures and to the technical processes of art, for experience has convinced me that without practical power of drawing and painting no real knowledge of pictures is possible."

* These accelerators were not used by Daguerre. He simply coated his plates with iodine, which required a long time in bright sunlight to produce an impression. They were introduced for the most part by American investigators.

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PHOTOGRAPHY, PAINTING AND SCULPTURE. BY A. S. SOUTHWORTH.

CONFINING ourselves to this side of the Atlantic, American painters and sculptors, until a very recent date, were wont to sneer at and actually deride photography as an important adjunct of their professional work in the formative processes in their studios. This applied to the most distinguished masters of our native art. The late George Inney or A. H. Wyant at the head of landscapists would show their teeth in the wildest kind of wrath should one suggest there were artistic expression, tone, perspective or power in the finest examples produced by the camera. The same was true of our leading portrait painters and sculptors, and it was not until the very highest class of magazines and art journals in the United States and Europe put aside wood and other engraving for half-tones after the camera, that the true art value of the latest development of the invention of Daguerre began to dawn upon and influence their professional workmanship. Such a phase of the innovation was made more emphatic by the deadly blow which this revolution in art methods dealt to the professional illustrators in black and white. There are also many other significant and collateral facts which tell on the potent influence which photography in its artistic treatment is bearing on the painting and sculpture of the present time. For example what educated artist of our generation goes afield to wrestle with his summer day "studies" in color in land or waterscape, in forest glen, in the varying phases of sky, sun, or moon, neglects to take with him a camera, finding on his return a new mystery and refinement in composition, before beyond his ken, by the product of his negatives. Many, of course, are not willing to allow this soft impeachment, but that makes the situation all the more interesting, for it only hastens the day when in its true relations to the higher arts, photography will assume without doubt or denial a positive position.



PORTRAIT BY REUTLINGER



PORTRAIT BY REUTLINGER

Another important feature but little known to connoisseurs who believe they have reached the acme of knowledge in portraiture, either in pigments, water color, pastels, or plastic art, is interesting. Artists in any one of those branches, who formerly affected to despise those who would work from photographs, when a living subject was available, now not only employ one negative made under their own eyes in the studio by a series embracing many views of the face and head, posed in a dozen different ways with photographic reproduction of draperies, differing arrangements of the hair, and so on. A celebrated sculptor in this city has been known to take as many as twenty-five negatives of a splendid subject, and then with his head and shoulder measurements with the callipers, say to her "I will only require one more sitting, and my work is done."

A propos of the subject above treated English technical and artistic writers on photography are pointing out a line of argument in harmony

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with our position. They claim that the misuse or misunderstanding of the word *imitation* and the true value that the representation of "things as they are" cannot result in artistic composition are even more plainly illustrated in the consideration of the conditions of portraiture than in landscape where so much has been achieved. In essence artistic composition is the same in one class of work as in the other, but this is often disputed or misunderstood.

Portraiture must concern itself chiefly with imitation, in the sense of personal pictorial expression. In a likeness, the person must be depicted as he is, that is, as he seems to us in the way we think the character best, shown or the aspect of the figure most natural, and cannot such a result be artistic in composition? Surely the limitations here for the photographer are very few indeed of an absolute nature. If the photographer have the necessary sympathetic influence over the sitter such as the painter-portraitist himself should possess, with the proper power of perception, and the ready and complete mastery of technique as to light and tone rendering, it is difficult to understand what is lacking for the particular purpose, save color.

That any artist should put into the portrait of a face more than ever could be expressed by that face at any one time is plainly absurd. Such a procedure implies a new face and character, and is not portraiture.

THE THREE COLOR PROCESS. THE YELLOW NEGATIVE.

By P. C. DUCHOCHOIS.

The yellow negative is obtained, as one knows, by the intervention of a screen (color-filter) absorbing the yellow radiations, darkening the green and but little interfering with the action of the blue rays, for if yellow were printing in the parts which should be blue, there would result a greenish blue unlike the color of the original.

To obtain this negative, most authors recommend non-orthochromatic plates of medium rapidity, and to expose through a violet screen, and even without a screen, which latter method is quite rational, since these plates are insensitive to red and yellow, and very little to dark green. The resulting negative consequently resembles an ordinary one, being opaque in the parts corresponding to the most refrangible rays and transparent for green (E), yellow, and red. Hence *yellow prints for red*, from which results that, by superposing the monochromes, red tends to orange, and one obtains tints and shades different from those of the original. To correct these defects as much as possible, it has been found necessary to subdue the effects, originated from the yellow printing in red, by first printing the yellow monochrome and using a red ink reflecting blue, such as carmine and madder lake, for example, to form a vermillion red with the yellow. But the general appearance is nevertheless thereby impaired, pure red never obtained, and various foreign tints and shades into which yellow unsuitably becomes a component are formed.

This manner of operating to obtain the yellow negative, although giving satisfactory results when photographing from nature, is wrong in principle. The three negatives ought to have the same character; only the parts corresponding to the eliminated color should be transparent, more or less according to its intensity or the proportion into which it enters in the hues; they should also be transparent for black and opaque for white, that is, the transparency in the blacks must be very pure, not fogged, and care should be taken that the white parts be not solarized, for, necessarily, different tints would be there substituted for white; in the print from the red negative, for example, there would be red, blue from the blue negative, yellow from the yellow negative, and, by superposition, these parts, which should be white, would be more or less variously colored. Similar effects would also result if the other intensities, those from the color not eliminated were not sufficiently intense.

The introduction of colors foreign to the original, often remarked in three-color prints, have no other causes than those above pointed out.

The rule is that:

The red negative, that obtained through the green screen, should be transparent only for red and black and opaque for yellow, blue, and white.

The blue negative, that obtained through the orange red screen, should be transparent only for blue and black and opaque for red, yellow, and white.

The yellow negative, that obtained through a violet screen, should be transparent only for yellow and black and opaque for red, blue and white.

Hence, to obtain a correct yellow printing negative, an orthochromatic plate must be employed, and it must be sensitive to red and as little as possible to yellow. Malachite green is probably the best color-sensitizer for that purpose. Its maximum of absorption is at C and the minimum, which is very low, extends from C½ to D¼ E; hence of the red sensitizers (cyanine, methyl violet, etc.), it is that which sensitizes the least for the yellow radiations and whose red sensibilization extends the most towards the extreme red. Therefore certain reds will be impressed during the exposure-time through a suitable yellow-absorbing screen, but if the reds are deep, then their impression will not be sufficient, and one should have recourse to a short supplementary exposure through a screen of medium intensity absorbing all the rays but the red and the orange red to obtain the desired result without risk of having the blue, the violet, and white, solarized.

THE DEVELOPMENT OF THE BURNISHER. BY E. J. PRINDLE.

BURNISHED photographs have always been the most popular photographs with regard to finish, although the matt surface has a large and increasing number of friends. The reasons for preferring the burnished print are probably that this style of finish is best adapted to show the details to the best advantage and, perhaps, our primitive liking for that which shines and glistens.

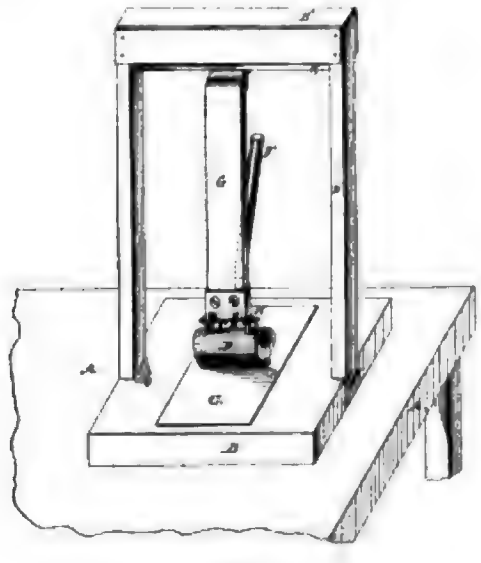


FIG. 1.

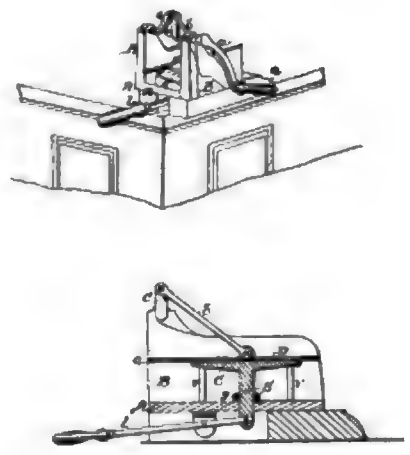


FIG. 2.

The development of the burnisher from the original spoon-shape hand tool to the present perfected machine is marked by a considerable series of interesting steps, showing that the form of burnisher now in use was only devised after long and arduous labors.

The first implement used for burnishing was a hand tool having a rounded end somewhat like the bottom of a spoon, and this was rubbed with considerable pressure over the surface of the picture. The same means is used to some extent by jewelers, shoemakers, and in other arts at the present day.

To give greater pressure over a larger surface the construction shown in Fig. 1 was devised. The flat bed supports two standards that are united by a cross-bar at the top. A stiff bar is hinged to the cross-bar, and it carries at its lower end a metal shoe having two lugs through which a pin passes. A head, having a hardened and polished bar dovetailed into its lower face, is hung on the pin in the ears of the shoe; and a long handle is secured in the head. By moving the handle, the polished bar is rubbed over the surface of the picture with considerable force by a toggle-joint action.

A more convenient but probably less effective form of machine followed in the shape illustrated by Fig. 2. The bed plate supports two sides having horizontal grooves in their inner faces, in which fit the edges of a steel plate whose under surface is highly polished.

The plate has a pitman or connecting rod jointed to a lug on its back, and the other end of the pitman turns on a crank shaft that is turned by hand. A reciprocating motion is thus given to the steel plate. The picture is pressed

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THE CLOSE OF DAY
BY L. V. KUPPER

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against the polished surface of the plate by a table that moves vertically on a stem and on guide pins passing through the bed plate. A hand lever under the bed plate serves to lift the stem and table to carry the picture against the burnishing surface.

The first instance of the use of a heated burnisher is that which is the subject of Fig. 3. The picture is held on a convex block, the block having this shape to counteract the curling of the print. A steel plate whose lower edge is polished and curved to fit the block, is bolted to a rod that is guided in the two vertical posts on

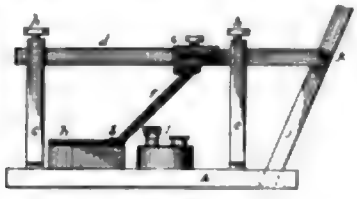


FIG 3

the bed plate. Screws in the tops of the posts serve to regulate the pressure on the picture, and a hand lever that is pivoted to the bar and that engages a hole in the bed is used to reciprocate the burnishing plate. An alcohol lamp is situated at the end of the picture block to heat the burnishing plate, and a much higher gloss is obtained than was possible before.

In the burnisher shown in Fig. 4, there is no

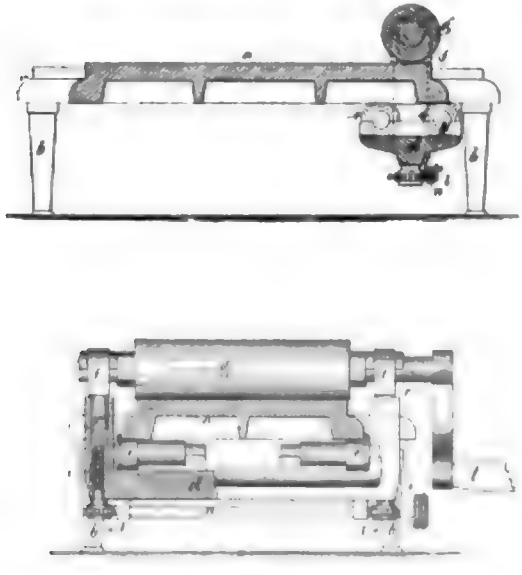


FIG 4.

motion between the polishing surface and the picture. The picture lies face down on a polished bed of metal that is supported on legs. A pressure roller, turned by hand, lies on top of the bed and carries, on its journals, journal boxes having stems that support a carriage below the table, which carriage is for the purpose of bearing on the under side of the table to hold the pressure roller down. On the upper surface

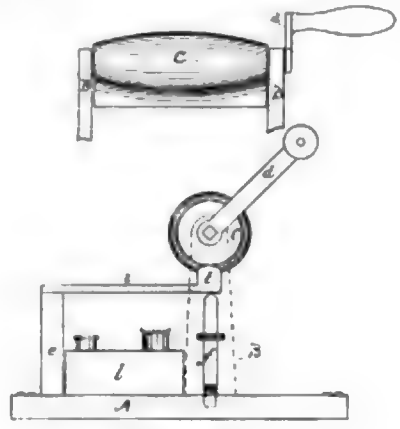


FIG. 5.

of the carriage are rollers that run on the under surface of the table. The stems of the journal boxes occupy holes in the carriage, and are adjusted by screws on the carriage. This ma-

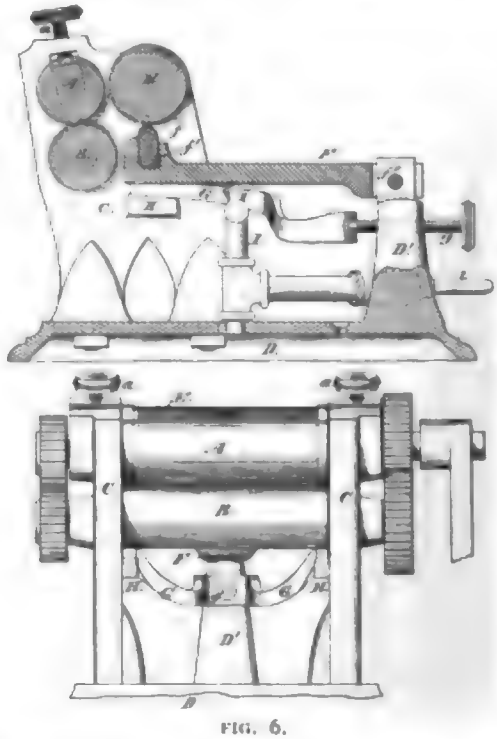


FIG. 6.

chine depends entirely on the mere pressure of the picture against the polished table as the pressure roller passes over it.

A curious expedient for curling the pictures automatically is shown in Fig. 5. The polished burnishing bar is mounted on the end of a spring plate that is secured to a standard on the base.

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The feed roller is mounted above the burnishing bar in standards, and the bar is forced against roller by a screw in the base plate. A lamp heats the burnishing bar. The roller is made cigar-shape, and the burnishing bar is correspondingly formed, the effect being to curve the picture backward.

The machine shown in Fig. 6 is similar in principle to that last described, having a feed roller over a burnishing bar, but the curling of the picture is accomplished by passing it through a pair of feed rollers geared to the main roller and so placed as to bend the picture as it leaves the burnishing bar. The bar is adjusted by the wedge-shaped ends of a yoke that is moved by a hand-screw.

Another variation of the form of burnisher in which a feed roller drags the picture over a burnishing bar is shown in Fig. 7. The roller

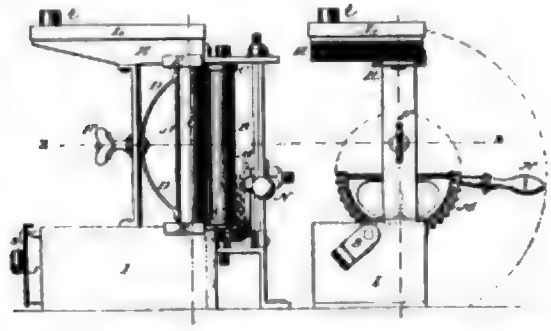
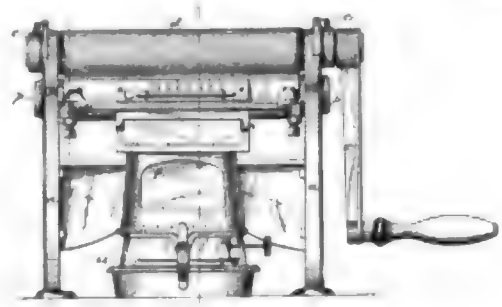


FIG. 7.

and bar are here placed vertically so that the picture may be seen as the burnishing takes place. The feed roller is rotated first one way and then the other by a gear segment carrying a handle. The burnishing bar is formed on a tube through which the heat passes from a removable heater in the base

The best form of the feed-roller burnisher-bar type of burnisher is illustrated in Fig. 8. The feed roller is mounted in bearings in a frame, and the hollow burnisher bar has two forwardly projecting ears that rest on set screws in the frame (the set screws being for alignment) and it has also a rearwardly projecting ear in which is mounted a hand screw to regulate the pressure against the feed screw. A lamp heats the burnishing bar.

The latest important improvement in the burnisher is the form in which a feed roller and a burnishing roller travel at slightly different rates of speed, thus combining the advantages of the old forms in which there was simple pressure of the picture against a polished surface with those forms in which the picture travelled over a large extent of polished surface. Such a burnisher is shown in Fig. 9. The lower, or burnishing roller, is mounted in fixed bearings in the frame, and the upper



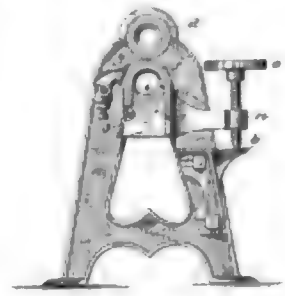
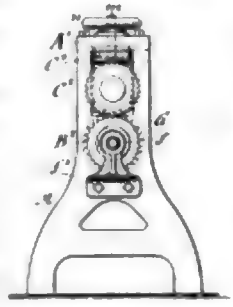


FIG. 8.

roller turns in journal blocks that fit vertical slots in the standards. The journal blocks are forced down by a hand-screw which is jointed to two levers that bear on the blocks. A Bunsen burner is mounted in a bracket on the frame and extends inside the burnishing roller



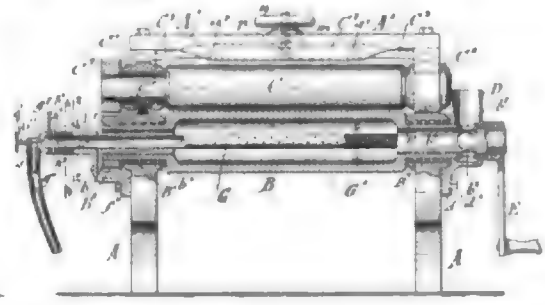


FIG. 9.

to heat it. The gas is regulated by a plug valve, and the inflow of air is controlled by a sleeve on the bracket, the sleeve and bracket having holes that can be made to coincide. The gases of combustion pass through holes in the opposite end of the burnishing roller and escape through a surrounding pipe.

It is difficult to foresee any further great improvements in burnishers; but, in view of its history, it is certainly not safe to say we have reached perfection.

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TONING WITH METALS OTHER THAN GOLD. BY B. O. B.

THERE are, in addition to gold, three other metals which may be, and often are, used to tone a silver print. In order of permanence, they are platinum, uranium, and lead.

A piece of P.O.P. platinum toned is as permanent a production as it is possible to obtain with silver as a printing basis. Platinum tones range from a delightful sepia to a warm brown, or with an extension of operations to be described below, a rich engraving black may be obtained. Double toning, in any case, is entirely absent, and this method is both quicker and less costly than gold. The tyro, struggling in vain with the sulphocyanide bath, will find in this a pleasant termination of all his difficulties.

Uranium tones are unsuited for P.O.P., but they are *par excellence* with bromide paper. In the course of years they slowly fade, leaving the print in its original condition before toning, and it may be restored to its pristine bloom and beauty by simple re-immersion in a fresh bath. The color imparted to the print by the uranium is extremely beautiful, being generally a warm red or brown.

Lead, as a toning reagent, lacks in permanence what it makes up in beauty, a print thus toned rarely lasting more than two or three years. It may be used with great advantage for proofs, etc, which are not required to be very lasting. Photographers are often chary of "wasting" gold on proofs, and yet desire to let their clients see what the finished photograph will look like. *Verb. sap.* Lead tones resemble those obtained with gold, a rich purple, cold or warm.

Having given a brief summary of the leading characteristics of these baths, I shall now proceed to describe the methods of working them in detail.

Platinum Toning.—The first and foremost requisite for platinum toning is, of course, potassium chloroplatinite, which is commercially retailed in 15-gr. tubes, hermetically sealed, just like gold chloride. The contents of a tube should be dissolved in boiling distilled water 15 ounces, and kept in a bottle round which has been pasted brown or black paper to keep out the light. Under these conditions it will keep about eight months.

If with gold there are a multitude of formulæ to select from, there are even more with platinum, no two that I have yet seen being alike. Briefly speaking, however, there is but one essential point—an acid solution of potassium chloroplatinite. Whether the acid be nitric, hydrochloric, citric, phosphoric, or what not, matters little, although the organic acids, such as lactic or citric, have less tendency to stain than the mineral acids (hydrochloric, nitric, etc.)

The following, recommended, I believe, by Mr. Lyonel Clark, will be found excellent in practice. The solution consists of

Chloroplatinite of potassium	1 part
Water	250 parts

To this is added sufficient nitric acid to turn litmus paper red. The print is washed in plain water to remove the soluble silver salts before toning. It is then laid face downwards on a sheet of glass, upon which has previously been poured a small quantity of the above toning solution. This is better than flooding the print in the usual way, as it requires only a small amount of solution, which, by the by, loses its properties rather rapidly. An ounce thus used will tone an 8 x 10 picture with ease.

Another formula which yields, in my hands, perhaps the best results of any is the following:

Potassium chloroplatinite	2 grains
Sulphuric acid	10 grains
Water	10 ounces

Before and after toning, the prints must be immersed in a solution of salt 1 ounce, water 8 ounces, and then thoroughly rinsed. This is to ensure the removal, in the first case, of all soluble silver salts, and in the second, of all soluble platinum salts. This is the the great secret of successful working.

The fixing bath in this case should be—

Sodium hyposulphite	4 ounces
Sodium sulphite	1 ounce
Sodium carbonate	½ ounce
Water	20 grains

Printing should be carried on rather further than for gold toning. The time to stop toning will be found from experience.

I promised above a method of obtaining black tones with platinum. Here it is:

Print deeply, tone for five minutes in—

Gold chloride	3 grains
Acetate of soda	¼ ounce
Water	16 ounces

Wash well and tone as above.

Matt surface P.O.P. of course gives the best results with a platinum bath, and a print on this paper well toned will compare very favorably with a platinotype, both in appearance and permanence.

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Uranium Toning.—To those who admire the facility with which bromide prints may be made, but who dislike their cold black tones, the uranium bath is indeed a blessing.

Prints should be rather weak and underdeveloped, as a slight intensification takes place. They must be thoroughly washed to free them from hypo, and then immersed in—

Uranium nitrate	50	grains
Pot. ferridcyanide. ..	50	grains
Glacial acetic acid....	¼	ounce
Distilled water.....	10	ounces

The image turns a reddish brown. As soon as the desired tone is obtained, remove it and wash in running water till the yellow color is entirely removed from the high lights.

Lantern slides may be treated in exactly the same way as, and even in the same bath with, the bromide paper.

Uranium tones, be it observed, do not suit every subject, and care must be exercised in producing them. What could be more ludicrous than a winter landscape, suggestive of frost and snow and bitter cold, printed in a warm red? Or, what again more in accord with the subject than a beautiful "sunset" effect of a rich harvest scene printed in the same striking color.



OUTSIDE THE SUB-TREASURY BY W. H. COOPER

Lead Toning.—To produce lead tones, the following solution must be made up in the manner described: Dissolve half an ounce of lead acetate in 20 ounces of boiling distilled water, and while the water is still hot, drop in, in small instalments, 4 ounces of hyposulphite of soda. It is most important that the water is distilled, otherwise a dense precipitate will form. As it is, there will probably be a slight one, which must be shaken up and used with the solution. None but the veriest tyro need to be told that the above is a combined bath.

Printing should be carried on very deeply, until the shadows are completely veiled and the high-lights have begun to change. The prints are then immersed in the cold bath. In a few seconds they will turn a horrible mustard color, a sign that fixation is taking place. Soon they will improve in appearance, and pass through various shades of red and brown to their final tone. At any stage, when the color is pleasing, they may be removed, washed for half an hour in running water, and dried. Toning, be it said, may be carried on in bright sunlight, after the first minute, with no ill-effect on the print.

What the exact action of this particular bath is, is as doubtful a factor as the permanence of a print thus toned. But, as I have said before, permanency is no consideration with proofs.—*The Amateur Photographer* (British).

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FINISHING NEGATIVES. BY CHAPMAN JONES.

It is customary in work of almost every kind to go over it carefully at its completion, removing defects, and generally perfecting it—giving it the finishing touches. Photographic work is no exception to the rule. Of course if the photographer is careless, or if in commercial work the price he gets or the time allowed him gives him no opportunity to finish his work, it is issued in a crude condition It is well known that the touching up or retouching of photographs has been carried to such an extent in modern times that some things called photographs have so small a proportion of photography in them that it is as much a misnomer to call them photographs as it would be to call a cup of tea a cup of milk, because of the small proportion of milk mixed with it. But, on the other hand, it would be as unreasonable to exclude all handwork because an excess of it is out of place, as to condemn moderate eating and drinking because some are gluttons and drunkards. And in such cases it is impossible to draw the line that shall separate the virtuous use of a power from the vice of excess. It is, however, always possible to keep so far away from the doubtful zone that exists between the good and the bad as to be above suspicion, and the desire to do this ought to be the guide of every photographer who is honest to his calling.

We say it is impossible to draw any line between the right and the wrong, and an illustration will perhaps indicate the kind of difficulty that attends the attempt. Suppose a round spot of clear glass a quarter of an inch in diameter on a cabinet portrait negative. If this spot occurs in the background, and the background prints black, it may be entirely negligible. If it comes, say, on the skirt of the dress, with a fold or shadow crossing it, it may be filled in, and the print is still a photograph, and there is no dishonesty or deception in calling it a photograph, and in omitting reference to the blemish that has been removed. But if the spot comes on the face, the most skilful of retouchers may work it out, and may even have sittings from the model to assist him in properly adding the missing details, but the result cannot honestly be called a photograph, because the most important part of it is a mixture of photography and hand painting. Illustrations of this kind could easily be multiplied. A photograph is supposed to present an accuracy that has become proverbial, that is, a truthfulness with regard to the actual object before the camera. Any after-work that tampers with this accuracy is to be deprecated.

It is impossible to photograph a type. An example or illustration of a type can be photographed, but the type itself exists only in the imagination, and though it may be painted, it cannot be photographed. The painter, in drawing a landscape, may alter some of the details before him, and so, perhaps, make his picture represent more strikingly the important characters of the country. This a photograph cannot do. He may shift a foreground object, and so on, but that is altering the landscape itself, not altering it in his view of it. His photograph is of the thing as it was when he photographed it, and if he alters his photograph, and succeeds in improving it pictorially, or making it more generally representative of the type, he may have produced a better and more desirable picture, but it is a mistake to call it a photograph, for it has lost the chief characteristic of a photograph, namely, the proverbial accuracy that is independent of the worker. We do not mean that general truthfulness that requires the greatest skill to attain to, but the mechanical accuracy which is present in all photographs, and is their chief characteristic, though it is sometimes so hidden that it needs a scientific examination to discover it. It makes no difference so far as the principle is concerned. whether the painting be on the negative or the print, and it is for those who make pictures by a combination of photography and hand-painting to invent a term that shall fairly describe their productions. If they lack the power to do this, that is no excuse for the misapplication of a word that has long been in use, and that specifically signifies something different.

It sometimes happens in a landscape negative that the sky and the land are both well represented, but a miscalculation either in the exposure or the development has given too dense a sky, so that to print it would ruin the rest. To get over this difficulty by non-photographic means is in general an operation that is on the border between the justifiable and the wrong. One might conceive of cases in which any such change would rob the photograph of its chief merit, but in other cases it is not so, and as the whole range of luminosity cannot, let us suppose, be reproduced, and there is a gap between the brightness of the sky and that of the landscape, it may be better to reduce this gap than

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to resort to other methods of overcoming the difficulty. We consider that the best way of doing this is to retard the printing of the landscape, and so give time for the sky to show.

To keep the various parts of the landscape true among themselves the retardation must be even, and no moving about of cloths on the negative during printing, as sometimes recommended, will do this. Probably the best material to use is the so called "mineral paper," which can be obtained from the Autotype Company, and doubtless other firms also. But we differ from some in the method of its application. It is of little use to secure it only to the edges of the negative if a part is to be cut away, and we think that for any purpose it is best fastened to the back of the negative by pasting it all over. For this purpose paste must be used, and not gum or glue, and when dry the surface should be of a uniform whiteness.

To remove the part that is not wanted, that over the sky, for example, the negative is placed on a retouching desk, and a knife is drawn along the skyline with just sufficient pressure to cut through the paper. If now a small brush, such as a camel-hair pencil, is dipped in water and used to moisten the border of the paper that is to be removed, taking care to place the negative so that if any water runs down it will not go over the paper that is to remain, it will be found quite easy to scrape away what is to be removed, as a pulpy mass, without any injury to the other.

Such an operation as that just described has a definite effect upon the negative, and with careful work every print will be the same. The two parts of the negative are exactly as before, except in the relation that each as a whole bears to the other. From a photographic point of view this method is preferable to the printing in of another sky, and even this may be regarded as permissible in some cases. But no such operation should be undertaken if there is any doubt as to whether it will effect the principal characteristics of the photograph, or if it seems likely at any time to cause deception. The real photographer, if he take any pride in his work, will always feel most satisfied and most honest, if there are degrees of honesty, when, the result being the same, his picture has been produced by simple and straightforward photographic methods.—*Photography.*

ON THE BEST FORMS OF LENS TO USE FOR PORTRAITURE. BY W. K. BURTON.

The time has passed, in most parts of Europe and America at any rate, when the word "portrait" placed before the other "lens" amounted almost to a fetish, it being believed very firmly that there was some quality in a "portrait lens," apart from angular aperture, flatness of field, and all the recognized attributes of lenses, rendering it in some peculiar way more fit to "take a portrait" than any other form of lens. That there are countries we wot of where the fetish idea still exists—where the first ambition of a young photographer beginning business on his own account is to possess a lens "dubbed "portrait"—does not much concern us here. It is good for opticians, and these will continue to issue "portrait lenses" as long as lenses with such a title are demanded; nor do we mean at all to suggest that lenses bearing the name are not sometimes better than any other for portrait work, but we think that all photographers should understand just in what way they are better, in what particulars they show no advantage over other lenses, and in what they are inferior. The subject is one that we have treated once before, but the recent revolutions—if we may be allowed the term—in lens making greatly change the point of view.

The distinguishing feature of a portrait lens, whether it be of the old Petzval form, or of any of several newer, may be said to be that it works at an aperture of not less than *f*/4, sometimes approaching *f*/2, giving perfect definition over at least a small area, and being practically devoid of chromatic aberration. These qualities were of the greatest value in the days of wet plates, when one of the greatest objects was to reduce exposures, and they are still useful in some cases, but in a much more restricted degree than they once were.

In the first place it is not at all often with the extraordinarily rapid plates that we now have at our service that we have any necessity to work at such an aperture as *f*/4, not to mention the greater apertures that most portrait lenses put at our disposal, and in the second place there is a law in optics—explained in these columns some years ago—whereby the limit of actual (not angular) aperture remains the same for the same subject, whatever be the focal length of the lens. Experience has convinced us that three inches, or perhaps three and a



ON THE HUDSON BY LYDELL SAWYER

half inches, is the maximum useful aperture in portrait work.

This means that there is no use for an aperture of *f*/4 for lenses of more than twelve, or, at the outside, fourteen inches focus, that is to say, for lenses that *ought* not to be used for plates much larger than 6½ x 4¾ in portrait work. This consideration brings us very directly to an important point. The lenses of the kind commonly sold as "portrait lenses" have distinct advantages for the everyday carte-de-visite and cabinet work of the professional photographer for some subjects and in some weather. For sizes at all larger they are of doubtful advantage; for sizes much larger they offer no advantage at all, but, on the contrary, most of them have distinct disadvantages.

Who at the present day, we wonder, uses a portrait lens of, say, six inches diameter with a diaphragm of a greater diameter than three inches? Yet it is not everyone who knows that, such being the case, he would be better fitted with any of several kinds of lenses having a maximum aperture of about *f*/8, and being much cheaper than a portrait lens in first cost.

When we last wrote on this subject there was practically no lens in the market with aperture between *f*/4 and *f*/8, now the gap is fairly filled, *f*/5.6 or *f*/5.7 being by no means uncommon, whilst *f*/6.3 is a favorite maximum aperture with makers of the newest forms of lens. 6.3 is practically twice the $\sqrt{16}$; this last having been proposed as the unit for angular apertures of lenses by Dallmeyer, and having been adopted in the factory of which he is the principal. For sizes not greatly larger than cabinet there can be no doubt that these are the best lenses for portraiture, even if they are not actually named portrait lenses. There is, however, a danger in connection with their use. The very fact of the extraordinary covering power possessed by many of the new forms of lens leads to the use of them for plates far too large, or, what is the same thing, leads to the use of lenses of much too short focus. Thus we discovered a photographer a few days ago using a double anastigmatic of only twelve inches focus for portraits on a 12 x 10 plate. He explained that "even full aperture it covered well enough for portraiture up to the very edges of the plate." Of course, this was an extreme case, but it seems difficult to make photographers in general understand that, for such a size of plate, a lens of *at least* twenty inches focus

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LANDSCAPE STUDY

BY SEYMOUR CONWAY

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should be used, and this absolutely without regard to any statements of the size that the lens *can* cover.

There is an excellent old rule as to the focal length that should be adopted for any size of portrait to avoid exaggerated perspective. It is that the focus should be not less than twice that of the length (or height) of the final picture.

This is, however, the focus *in use*; very nearly the same as the solar focus for lenses of short focus, very different for those of long. Thus a lens of twenty inches solar focus is never likely to be used for portraiture with a less conjugate focus than twenty-two or twenty-three inches, that is to say, about twice the length of a trimmed print likely to result from a 12 x 10 negative.

Above a certain size the single lens becomes not merely admissible, but the best for portrait work.

A single lens gives no appreciable distortion if the rule as to focal length given above be strictly observed. Single lenses are now made that give perfect definition at apertures of *f*/12 or *f*/12.5. Such a lens with a focus of thirty-six inches or somewhat over, and an aperture of three inches will be found better than any other kind of lens for a plate of such a size as 22in. x 17in., for it is unlikely that such a lens will be used with a less extension than forty four inches.

We thus have it, to put it as briefly as possible, that:

Portrait lenses are the best (or have advantages over others) for small work.

The various kinds of rapid doublets—anastigmatics, etc.—are the best for moderately large work.

Single lenses are the best for very large work.

We are here assuming that absolute sharpness is desired in at least one plane. If not, single lenses have advantages for all sizes, the aperture being opened sufficiently to give distinctly appreciable spherical aberration.

Again, for large work, the Dallmeyer-Bergheim lens has distinct advantages, especially as it gives us the power of varying the focal length within very wide limits. When first we worked with this lens we found some difficulty in making the necessary adjustments, but when we had overcome this we found it a most useful instrument.—*Photography.*

ACTION OF THE BROMIDE RETARDER IN DEVELOPMENT.

BY C. WELBORNE PIPER.

An alkaline developer necessarily contains a reducing agent capable of removing the halogen from a silver haloid salt, which reagent naturally has a more rapid effect upon a subsalt containing a smaller proportion of halogen. It is, however, necessary to so modify the reducing power of the developer as to render it incapable of producing any effect upon the normal salt in the unexposed non-image during the time necessary to develop the image, hence the normal salt in the exposed particles—which contain both normal and subsalt—cannot be reduced directly by the developer, but only indirectly, as the result of the reduction of the subsalts with which it is in contact. That is to say, the metal reduced by the developer from the subsalt, in its turn, abstracts bromine from the adjoining normal salt, and converts it into subsalt.

In effect, therefore, the first result of development is a gradual increase in the quantity of subsalt, and this action probably continues until the whole particle is partially reduced, whereupon continued development causes the permanent reduction of metallic silver.

The rapidity with which a particle is completely reduced depends upon the initial relative amount of subsalt it contains as the result of exposure; or, conversely, the slowness of its reduction depends upon the relative amount of normal salt in contact with the readily reducible subsalt. If then we introduce into the developer a soluble haloid salt from which the nascent silver may abstract halogen as well as from the normal salt, the reduction of the latter, and consequently of the whole particle, may be further delayed, the effect being proportionately much greater in the case of a slightly exposed particle, containing only a small proportion of subsalt, than with one more fully exposed and containing a larger amount. Here we have an explanation of the temporary retarding effect of a small quantity of bromide upon development and of its tendency to increase contrast. In excess, however, the bromide may have a restraining effect, for it may prevent the permanent reduction of metal and so lead to a lack of density in the fixed image.

If a very large excess of bromide is added to the developer when development is fairly ad-

vanced, some of the work already done is destroyed, probably because the metal produced by the further reduction of the existing subsalts reacts with the bromide to form a normal salt. This effect is most obvious if the greater portion of the developer is poured off the plate and the dish is filled up with with a plain bromide solution. The finer shadow detail is completely destroyed and is incapable of further reduction. This result of the continued action of the developer in the presence of a large added excess of bromide may be looked upon as analogous to the effect of solarization produced by the continued action of light in the presence of the continually increasing quantity of freed halogens.

As the effect of bromide varies with the relative quantity present and inversely with the reducibility of the particles, a certain quantity may act as a restrainer in the weaker parts of the image, and simply as a retarder in the others, in which case it must affect the scale of the gradation.

The retarding effect of a plain solution of bromide applied before development may be attributed to the formation of double salts not readily reducible, and possibly the effect of bromide in preventing the direct reduction of the unexposed non-image during development may be explained in the same way. The reduction of the particles in the non-image may, however, be brought about in the absence of any bromide, otherwise than by the direct action of the developer.



THE BELLE OF STAMBOUL. BY ROBERT E. M. BAIN



A DAUGHTER OF THE PEOPLE. BY R. E. M. BAIN

In a gelatine film the different particles being isolated from each other are developed individually, and each upon its own merits, as we may express it, the image being thereby preserved; but, to a certain slight extent, and under certain conditions, it is possible that reduction may spread from the image to unexposed particles in its immediate vicinity. The gelatine separating the particles of course becomes impregnated with the developer, and if this contains a bromide salt then the nascent metal in any particle undergoing reduction, instead of attracting bromine from an adjoining unexposed particle, abstracts it from the intervening haloid as the nearest source.—*The Amateur Photographer* (England).

A New Photographic Telescope is being made for the observatory of Cambridge University, England, by Sir Howard Grubb, and the building for its accommodation will be taken in hand this year.

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BACKED PLATES.

One of the most surprising facts in connection with the practice of photography is the dense conservatism characterizing the modes of working of a large number of both professionals and amateurs. Take the now ubiquitous dry plate itself. How many years were they not advertised, and of good quality too, before any, but a small band of workers made any use of them? It is true they were advertised at so much per square inch, and their price at that time was far beyond the present exceedingly low rate, hence economy might be said to stand in the way. But such an excuse would be based on false premises, for the simple reason that a large proportion of the best wet-plate men always used patent plate, the price for each piece of this glass being more than double the sum now paid for glass and film combined. Let us take again, the use of sulphite of soda with the developer. It is difficult for later-day workers to understand how photography was carried on without sulphite, yet such was the case, and it was some years after Berkeley introduced it into photographic practice before its true value was appreciated or its merits known. Finally, let us examine the history of backed plates, because it is far more than a quarter of a century since it was discovered that by "backing" the plates of that day with a suitable substance the effect termed halation was either entirely eliminated or reduced to a minimum.

In consequence of this discovery, some of the dry plates then made were sold ready-backed. There was, however, never a large sale, and some time before the advent of gelatino-bromide, the Hill-Norris plates held the field. Then came the era of gelatino-bromide, and the backing of plates fell into desuetude. After a while, the need for a remedy for halation became talked about, and the old idea of backing came to the fore. A few wise ones put it into practice; but to this day an immense majority of workers never employ it, partly, no doubt, through ignorance, partly through supineness, partly through the dogged conservatism we speak of.

For many years past we have, in season and out of season, referred to the subject and insisted upon its necessity. We should like to point out that we have shown, and would still continue to show, that there is great usefulness in plate-backing in a far larger number of cases than those gross ones instanced so often when taking views with dark objects cutting against the sky, or interiors with brightly illuminated windows. The effect of the reflection at the back of the glass is there plainly visible in "halation" effects; but, in taking a portrait, for instance, a similar effect of reflection must be operative and degrade the half-tones, though it might be difficult to place the finger on the spot, as with halation proper.

It is not to be supposed that backing has been in all cases, and with every one, a mere occasional fancy, for we know, at any rate, of one instance where a well known professional has had a dark room fitted up specially for the purpose of plate-backing, he, no doubt, finding that to do it under ordinary dark-room conditions was running too much risk, either of accidental spoiling of the plates by thoughtlessly admitting actinic light, or by the light found sufficiently safe for a few minutes needed to develop being actinic enough to fog plates exposed a sufficient time for the backing to become dry. Such work, however, becomes a heavy tax upon the time of the experienced hand, and it is a subject of some congratulation to us that our labors appear at least to be fructifying in a direction to save this waste of time. For some years past one firm of plate makers, who make a plate of great excellence, but not perhaps in such large quantities as some of the great establishments, has always listed plates ready-backed, and now their example is being copied by others, or our teaching is bearing fruit, it matters not which. We think it probable that the time is not far distant when all plate-makers will stock ready-backed plates. Some years ago we described a simple mixture for backing, which any one could make, and the materials for which were always at hand; nothing could excel it for the purpose; but, so long as the backing is efficient, we have no feeling in the matter as to what form it takes. But there is one very important point to be considered in the choice of a backing, on which we desire to lay some stress—the facility with which it can be removed. For simplicity, ease, and cleanliness, none can surpass that of the firm we referred to; it is simply black paper suitably attached, and it peals off shortly after the plate is placed in the developer, and before the development is complete. Next we come to a pigment applied in conjunction with a suspensory medium of refractive index near to that of glass, this being the method recommend by us in these columns. When an unsuitable medium

is employed, it may be too difficult of removal, or too tacky, through excess of glycerine, to admit of convenient handling. These points should be well considered.

Finally, we come to the plan recommended many years ago by Captain Abney—the use of a collodion colored by aurine and magenta or other suitable dye. This plan is very effective, but is has a great drawback. It is adopted by one large firm who list certain of their plates ready-backed (in this manner) at no increase of price. A correspondent, writing on the subject, complains to us of the immense amount of labor needed in getting rid of the backing.

He tells us that on Jubilee Day he took a number of large plates so backed, which he desired to print from at once; but, when he came to removing the coating, he found it absorbed such an immense amount of time that he could not get his prints through, and the annoyance it created was so great that he found the English language insufficient to express his feelings. He tried scraping it with a knife, and so filled the air with fine particles of dye that he ruined a number of prints that were exposed to dry by irretrievably dyeing them. He tried methylated spirit and ether, and dyed his hands all over. He used a knife to it while wet, and found half an hour a plate not enough time to give to the work.

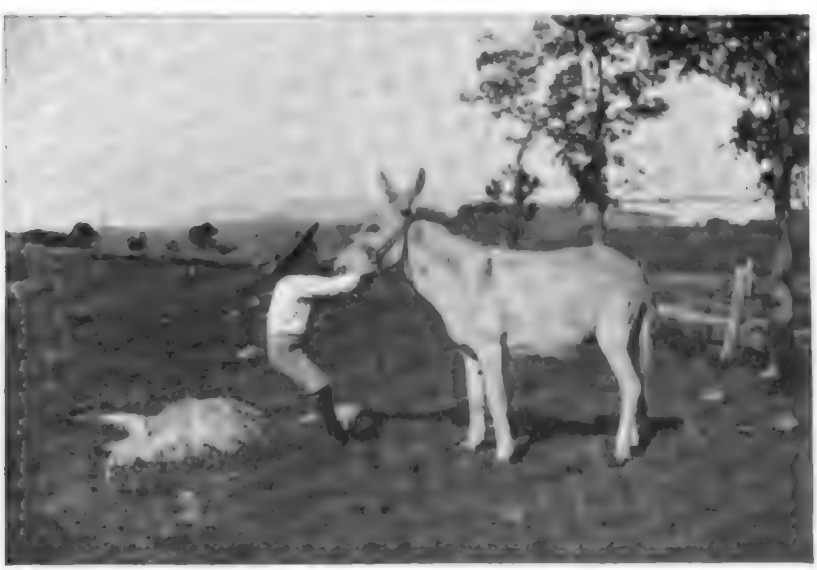


IN DAISY TIME BY ALFRED CLEMENTS

In conclusion, we can only say that, though backing, even the best, is no certain cure at all times for halation, it is so great a palliative that no one should attempt outdoor or interior work without backing his plates by one or other of the plans we have described.—*The British Journal of Photography.*

HINTS ON PHOTOGRAPHING POLISHED SURFACES.

EVIDENTLY the photographing of highly polished surfaces presents difficulties to some, if one may judge from the number of queries that are continually being replied to through the Answers column; but there is really very little difficulty in the way if a few simple expedients be resorted to. Suppose, for example, a group of plate has to be photographed, some portions of which are highly burnished, while others are frosted or matt. The most common, and, on the whole, perhaps, the best way of dealing with it is to take a piece of tolerably hard putty, and with it evenly dab or stipple over the bright portions of the metal; it will dull the surface, and thus prevent reflections—



THE TUG OF WAR.

(Briggs Kilburn Adams and his Donkey)

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the only source of trouble. After the photograph has been taken, the putty can quickly be cleaned off with a plate brush charged with whiting and a little benzole.

Another plan, which is frequently adopted, when photographing cups, vases, and the like, is to moisten the atmosphere of the studio, either by sprinkling the floor with water, or by means of a scent sprayer, and then placing a lump of ice in the vessel. The moisture in the room then condenses on the cold surface of the metal, and thus renders it dull and non-reflective. When this method is adopted, the precaution must be taken that everything is ready for the exposure being made before the ice is introduced into the vessels, as the moisture condenses rapidly on the cold metal, and soon collects in sufficient quantity to run down the sides in tears. After the exposure is made the ice should at once be removed, in case a second negative has to be taken, in which case it can be reintroduced, when the moisture will condense afresh. We are here assuming that the articles to be photographed are such that ice may be put into them, but that is not always the case; still advantage may be taken of the condensation of moisture by simply keeping them for some time previously in a cold place; then, when they are brought into a warm or damp atmosphere, condensation will take place.



ON THE WANDLE BY J. CARPENTER

There are cases, however, where the owners of the plates will neither allow the putty to be employed nor ice to be used. Then the difficulty of the photographer is increased, but with judgment it may be overcome. He must now depend entirely upon the illumination of the objects, and that alone. The main thing is to so light the subjects that there are no reflections from them in the direction of the lens. As the angle of reflection equals the angle of incidence, it is obvious that all front light must be stopped off, and only a side light used, so that all the reflections are away from the camera. The light falling on the objects should be as concentrated as possible, and if there are any deep shadows—and there will be if the highly burnished portions are in shadow, as then they will appear nearly black—they may be softened by means of a reflector, care, of course, being taken that none of the light from it reaches the lens. The best angle of light for most subjects will be about 45 degs. That angle will be found to show the chasing or engraving very clearly, but a more direct side light will often do so still better.

The development of the negatives should be done tentatively, so as to get out all the detail in the shadows before density is obtained in the lights. Very often, besides the chasing, there is an inscription, and, in the case of a presentation plate, it is imperative that it be distinctly rendered. Here, again, a strong side light is an absolute necessity, for, unless one be used, the inscription will not be readable in the photograph. Here is a dodge that many do not know of. It is this: Take the article or the inscription plate to a copper-plate printer, and get him to fill in the lettering with ink, as if he were going to print from it. As the letters will now be in black ink, the inscription will be very distinct in the photograph; the ink can afterward be removed with a little benzole or turpentine.

One thing to be specially avoided in photographing plate is under-exposure and a forced development, which are the most common faults in photographs of plate. The exposure should always be timed for the shadows, and not for the lights, as is too frequently the case. In photographing any bright objects, a great advantage will accrue from the use of backed plates.

Copying Daguerreotypes seems to be a difficulty with some, but these pictures are really very easy to copy if we keep in mind the fact

that the angle of reflection and the angle of incidence are equal; hence, if all front light be avoided, and the picture illumed by a side light only—say an angle of 45 degs.—an excellent reproduction will be obtained.

Bright machinery has often to be photographed, and sometimes where it is very unequally lighted. The only thing to be done under these conditions is to paint over the polished portions, or, better still, the whole machine, with flatting color. This most engineers now do who have their machinery photographed. The flatting color is readily cleaned off with benzoline or turps, and a pledget of cotton waste. Usually the maker's name is on the machine, and it is important that it shows very distinctly in the photograph. As the letters are usually in relief, it is a good plan to just whiten the surface of them with a piece of chalk.

In photographing tombstones or monuments —say of polished granite, with the letters in gold—it is sometimes difficult to get the inscription distinct, even when it is illumed by oblique strong sunlight. The best thing to be done in a case of this sort is to make up a stiff paste with whiting and water, and then fill in the letters with it, using a palette knife for the purpose. After the photograph has been secured, the whiting can be quickly removed, either by brushing it out dry or by washing it out with water.—*The British Journal of Photography.*

LARGE OR SMALL SIZE?

THERE is an old Yorkshire saying with regard to horses that "a good big 'un is better nor a good little 'un," and whilst we are ready to admit that the Tyke knows more about quadrupeds than canvasses, still we think the same rule applies to pictures, including, of course, photographs.

In the consideration of this question we think we may reasonably be guided by the practice of the painters, because experience and study bestowed on every point of their art has settled certain fixed rules, and because, though they may not like us to say it, our objects are the same as theirs. Granting this, can any one of us call to mind a well-known painting so small as the usual size produced and exhibited by photographers?

Personally we have failed to do this either in home or foreign collections, and the smallest great picture we can remember exceeds the whole plate size.

Even the painters who delighted in diminitive panels or canvasses—say Gerard Douw among the old and Meissonnier among the modern masters—never, to our knowledge, painted as small a work as the size we have suggested, and although their methods and style of expression suggested the viewing of the picture at close quarters—they may properly be termed cabinet painters—yet the measurements were generally nearer 12 x 10. To our idea a certain increase on the present size of our prints is necessary to show the actual qualities of the work itself. It is all very well producing work which one's friends, or the critics (some will say the two classes are synonymous, and some not), call "a little gem"—"full of quality." It is so small, say 3 x 2, that it need not hold very much to be chock full up to the brim; but it is primarily intended to be seen and enjoyed by the eye, and the former is just possible, whilst the latter is quite out of the question considering our focal arrangements have to be abnormally screwed up to view it.

Some one has said that one of the qualities of a picture should be that it seems like a view of nature seen through a window, that a wall hung with pictures should be as though their fortunate owner could look from his room on various aspects of nature itself, as seen, of course, through the temperament of other men. Thanks, however, to the abolition of the window tax, we are no longer limited in this respect, and unless keyholes are the means of view there is a popular prejudice in favor of a larger aperture than 3¼ x 4¼, or 5 x 4, or even 6½ x 4¾.

Again, too, it is one of the fundamental necessities of artistic criticism and appreciation that the eyes, when once directed on the object, should rest there without interference from outside surroundings—for this reason is the frame or mount—but it is impossible to do this on the smaller sizes.

In the most successful small-sized photograph such success is gained generally by attempting to rival the miniature painter—and this is impossible owing to the difference in material and process. Some Lilliputian works, it is true, have been treated in a large manner, and their success has only created a wish that the worker had not limited and handicapped himself and his work so unnecessarily.

Probably the reason of the state of affairs is

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the question of convenience and economy—convenience and handiness in the production—economy in the materials required. And, on the surface, these are practically very good and strong reasons, but theoretically, and, when we examine them below the surface, they are absolutely bad, and merely excuses created by expediency. "Oh," says the amateur, "I can't carry a 12 x 10 about all day long, and I can't afford plates at 16s. per dozen." This is perfectly true, but is it necessary to follow both or either of these courses?

If every picture which is projected was ultimately worthy of completion, then we certainly should say both contingencies were necessary, but then the happy producer would probably be in a position to use his carriage and pair, or even four-in-hand, to drive him to the *locus in quo*, and plates would be a mere trifle against his banking account in spite of the limited discounts. But, unfortunately for us and our art, and the world generally, every picture which is initiated does not seem, even in our fondest and most enthusiastic moments, a fit legacy for posterity. With the best workers there is a limitation of results, owing to the fact either that they make few exposures or that they do not hesitate between their shelves and the dust-bin.

But the exhibition walls of the last two years show that the question of size is being considered, and last year's autumn shows were distinctly a move in favor of large work. From what we hear, too, the coming year will see an even more pronounced determination against the limitations of inches, due, probably, to the large adaptation of rough surfaced papers, the belief that insistent detail is not in all cases necessary to the picture, but may be sacrificed in some instances to breadth and general effect, and more than all, to the fact that slowly, but steadily, photographic work is, in spite of the rabid enthusiasts on both sides, assuming a place among the pictorial arts.

For these reasons it is worth while each worker considering whether the limitations of the size of his plate have been allowed to affect his final work, and whether such limitations should not be avoided in a process in which there are so many unavoidable ones. That they can be so avoided by the exercise of a little further trouble is an axiom that applies to the majority of our difficulties, and here are some suggestions we venture to make:

If a large-sized camera is used, two courses are open—either to choose the view previously, settling by observation the character of lighting, atmosphere, accessories necessary, and then, having these in existence, make the exposure, and come straight home; or to learn to exercise that power of restraint—theoretical only, alas! with most of us—which will enable one to take out six virgin plates and return with them undefiled if no suitable subject has presented itself. Happy is the photographer who can resist temptation!

If, on the contrary, the smaller sized camera is the favorite, there are many ways within the reach of all of us to secure an enlargement.

If the successful negative is chosen and a transparency carefully prepared from it on a slow plate, and with every effort to obtain full gradation and avoid blacks or whites, from this, after repairing all mishaps, an enlarged negative can be produced with the aid of only the outfit which was originally used. I have lately seen some enlarged paper negatives made by an amateur who has little time to give to photography by fixing his camera to a hole cut in the shutter of his dark-room cupboard, and having placed a glass transparency where the focusing screen was, and then printing the bromide paper—ordinary bromide in this case—on a board in front of the lens. But Wellington and Ward make a special bromide negative paper at a speed of, say, Ilford Rapid, which is almost grainless, and does not require oiling before it is printed from. Nothing can be better for this purpose than an ordinary attic skylight, for the paper, mounted on a board, can then be put on a stool or table or the floor so as to get the exact distance.

Paper negatives are unbreakable, are easily stored, and are very simple to subsequently work upon. If one were a millionaire (we have yet to discover the photographic variety, and we do not see it possible for him to exist), we would suggest making an enlarged transparency from the original negative, and then the final negative, but this would mean the additional cost of a large-sized plate. In any case during the progress one would have ample opportunities of modifying to one's wish, of retouching and shading and masking, and the fact that one can do it quietly in the worker's own dark-room should guarantee a fine result at the finish.

And writing of modifying, we wonder why, when a negative is obtained from the camera which is unsatisfactory, by making from it a transparency and then another negative, using



Parkstraus & Presden Engraving Co.

PORTRAIT STUDY
BY ADOLPH MEYER

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the developer for each with brains, more "wastrels" are not saved. But that, as Kipling says, is another story.—*Photography.*

THE JOLY COLOR PROCESS.

EVERY photographer has at sometime longed to be able to fix the colors of objects so that he would have a photograph showing what is seen upon the ground glass of a camera. This fifty-year dream of the photographer has, after many attempts and failures, at last been realized by Professor John Joly, of Trinity College, Dublin. Dr. Joly's method is very simple in so far as it concerns the photographer. All that is needed, beyond what is now employed by the photographer, are two screens. One of these, called the "taking" screen, is of a greenish or yellowish-green hue to the eye, and is placed in the camera directly in front of and in contact with the orthochromatic plate. This "taking" screen consists of a plate of glass, on one side of which are fine lines of orange, yellowish green, and blue color in alternation. These lines are sufficiently fine to blend or be unobtrusive to the eye, and are some two hundred or more to the inch. The exposure is made slightly longer than usual with the same quality of plate, and a screen for preventing the action of the ultra violet rays of the spectrum is used. The negative is developed as usual, and the positives are printed upon glass or other transparent support in the ordinary manner. Both negative and positive have the appearance of lines of light and shade, this being due to the filtering action of the lines upon the "taking" screen. The photographer now places upon the positive the second, or "viewing" screen, which is provided with lines transmitting red, green, and violet; *i. e.*, such light as will excite the fundamental color sensations. This screen is placed line upon line of the positive in such wise that the red lines come over those lines of the positive which correspond to the lines of the negative taken behind the orange lines of the taking screen, and so also of the green and yellow-green lines, and the violet and the blue lines. Upon holding the two plates, photograph, and "viewing" screen, against the light, a photographic representation of the object in its natural colors, or in colors seeming such to the eye, is had. The color photographs may be projected upon screens by means of the lantern, or they may be framed and hung in a window, or be put in albums.

It is to be borne in mind that the "taking" screen cannot be used for both taking and viewing the photograph, for then the fundamental colors, red, green, and violet, and all derivatives therefor, cannot be obtained. Also, the "viewing" screen cannot be used for taking and viewing the photograph, for then the intermediate colors (the oranges, yellows, and blues, as well as the purples), will be very inadequately reproduced; in fact, they are practically absent. The reason why the "taking" and "viewing" screens are not interchangeable is that the linear areas of the photographic negative must register the color values of the object accurately; this requires that the greatest photographic action shall be in the orange, yellow-green, and the blue regions of the spectrum; hence, the "taking" screen is provided with lines in orange, yellow-green and blue colors. Coming to the combined positive and "viewing" screen, it is a matter of putting together such amounts of the fundamental colors, red, green, and blue-violet, as will properly synthesize, or make up, or match, the colors of the original object. It is well known that the eye is unable to distintinguish between the yellow of the spectrum, and a yellow formed by mixing proper amounts of fundamental red and green light; the same is true of the spectral blue and a blue formed by mixing proper amounts of the fundamental green and blue-violet; and what is true of these colors, yellow and blue, is true of every other color of the spectrum.

These who are interested to pursue the scientific side of the subject further will find *Young's theory* of color vision *in extenso* in Chapter 9 of Rood's *Text Book of Color*, and also in Abney's book on *Color Vision*. The color value or density curves are on page 104 of Rood's work.

THE WASHING OF GELATINO-CHLORIDE PRINTS.

BY A. V. KENAH.

THERE seems to be a very great deal of doubt still in the minds of photographers, especially among those who do not read up in the yearly almanacs and papers the recent researches of those who make it their duty to probe and dig into the inner recesses of the mysteries attending photography, on the time it takes to wash a print. I have particularly noticed this of late when in this paper I have seen so many photographers explaining their methods of washing prints and the contrivances which a great many recommend. A large number of these latter show much ingenuity on the part of those who construct them, and, as such, deserve praise, but after all, they are not necessary, as I intend to show if you will only take the trouble to read this article.

One of the greatest authorities on the washing of prints is Mr. Haddon, who has investigated the subject very thoroughly, and who has published some of his results in the *British Journal* for 1897. There are, consequently, a very large number of you who are acquainted with his researches, and who probably have greatly benefited by them. It is, however, for those of you who have not read Mr. Haddon's paper which he delivered to the Convention, that I am now, by his kind permission, re-writing his interesting results. He writes:

"When dealing with the question of washing prints, three questions have to be answered—

"1. What must be the ratio of the volume of water to the area of paper to be washed?

"2. How long must the prints be allowed to soak in each quantity of water?

"3. How many changes must the prints be subjected to?"

The actual tests were made on albumenized paper in preference to gelatino-chloride, as the latter is usually so loaded with barium sulphate that it is difficult to obtain clear solutions by filtrations through paper, especially when treating the ash of the burnt paper with ammonia. But what applies to albumenized paper equally well applies to gelatino chloride. The first thing to be decided was the ratio of the volume of water to the area of paper.

1 c. c. per square centimetre of paper, *i. e.*, roughly, about 1 fluid ounce of water to every 4½ square inches of surface to be washed, was settled on. After the prints had been fixed the requisite time, they were plunged and separated from each other as rapidly as possible into the measured quantity of water. After soaking for five minutes, two pieces were taken out and dried, the remainder being transferred to another dish, with the quantity of water diminished in proportion to the area of the paper removed.

This operation was carried on till the last pieces received ten soakings of five minutes each in ten different changes of water.

A portion of each washing water was set aside for testing with permanganate of potash, iodide of starch, and sulphuretted hydrogen dissolved in water.

It was found by experiment that one drop of each of the solutions of permanganate and iodide of starch produced a distinct coloration in a test tube, filled with water, 6 inches long when looked through lengthwise at a sheet of white paper.

In order to ascertain when the hypo had done its work, such a number of drops of the reagents were added to the water in similar test tubes so as to just match the tints in the test tubes filled with plain water and one drop of the reagent. The number of drops required in each case, and the amount of silver left after each washing, will be found in the table below. The ash was then treated as is usual in such operations, the precipitate was then collected and weighed, and the silver estimated in the ordinary way.

The following table gives the results obtained:

Change of Water.	Silver in ½ Sheet.	Number of Drops of		Sulphuretted Hydrogen.
		Permanganate.	Iodide of Starch	
1	'0155	More than 10	More than 10	Brown color
2	'0043	More than 10	More than 10	Faint tinge
3	'0040	2	3	No color
4	'0040	1	1	"
5	'0044	1	1	"
6	'0042	1	1	"
7	'0044	1	1	"
8	'0040	1	1	"
9	'0043	1	1	"
10	'0040	1	1	"

These results show that after the third washing the amount of silver becomes constant, and that further washing has no effect as regards reducing the quantity of silver left in the paper.

It will thus be seen that it is not necessary to wash prints for a long time: in fact, long washing only softens the paper and makes it stick when trying to glaze it, and also tends to discolor the whites. One of the simplest ways I know of to wash prints is to cut a groove in a cork and place it in the waste pipe of sink; turn on the tap and regulate the inflow until it equalizes the outflow; keep the prints moving all the time, and fifteen minutes will be found to be ample for their thorough washing. The advantage of this method is that the supply salts are taken away from the bottom, and a constant soluble of fresh water is given to the prints. This method is, of course, only applicable where there is running water. In cases where this is not to be obtained, several changes and keeping the prints moving all the time will be found to answer the purpose just as well.—*The Photographic News*

Insoluble Carbon Tissue.—Kastner states that carbon tissue which has become insoluble on the surface may be rendered fit for use by floating the paper films downwards on hot water, by which means the insoluble film floats off, and the tissue should be immediately immersed in cold water, and squeegeed down to glass or ferrotype, again sensitized and dried. He states that this gives absolutely pure whites, and the small quantity of film removed has no effect on the intensity of the image. —*British Journal of Photography.*

THE USE OF THE SWING-BACK—A CHAPTER FOR BEGINNERS.

BY REV. A. H. BLAKE, M.A.

IT is necessary that the beginner should thoroughly understand the powers which are placed in his hands by the judicious use of the swing-back. Many might be

inclined, in purchasing a camera, when expense was an object, to ask, "Why have a swing-back at all, can we not just as well dispense with it, seeing that excellent photographs can be taken without it?" So indeed can excellent photographs be taken without a lens, but we cannot therefore always dispense with that useful and necessary part of the photographer's kit.

Let us imagine first of all that we are required to take a building or a church. We find on placing our camera in position that, though otherwise all is as we desire it, the upper parts of the building or the church tower are just cut off. This will never do, so the rising front is lifted as far as it is possible, and yet the whole church is still not included on the screen.

What is now to be done? It will be necessary to tilt the camera until we get in the whole of the building.

Now, again, considering the image on the ground-glass, we find that though we have been successful in getting the whole of our subject in position, yet the doing so has had a disastrous effect upon the parallel lines of the building, giving the walls a V-shaped appearance, and the whole conveying to the mind an idea of extreme instability.

By what means should we remedy this fatal defect?

Take the ground-glass in hand, and swing it backwards and forwards until the lines resume their vertical appearance; in this way it will be found that all convergence has been successfully removed.

A very useful little instrument is to be obtained which, placed upon the side of the camera, will indicate when the ground-glass is vertical.

But now another difficulty meets the beginner. Parts of his building are not in focus, and so matters are still far from satisfactory; but the insertion of stops till the desired sharpness has been obtained will obviate this difficulty.

But it is not only in architecture that the swing back is of such great use. The landscape worker will find it a great addition to his powers in the field, especially in relation to foreground work

A good foreground is very essential to the success of a photographic picture, but it will often be found that to get the foreground and distance in proper focal relation to each other is not easy.

Suppose there be few straight lines in the composition, it will be found quite possible to move the swing-back in such a way that the foreground and distance can both be got fairly into focus together without the use of a small stop.

This has two advantages, the first being that the smaller stops destroy atmosphere and seem to glue all the different planes together, and the other that we can still give short shutter exposures if necessary, which would be difficult perhaps with strong foreground subjects stopped down when there is movement of trees, or water, or quick-drifting clouds blown by the wind across the heavens.

But we have left ourselves scant space to speak of the use of stops, which the little perforated metal disks supplied to the beginner with his lens are called.

Stops are of three kinds—the "Waterhouse" stop, which is a metal disk supplied with lens and inserted into a slit in the brass-work of the lens between the glasses. A second kind, called "rotatory" stops, have a revolving disk, with the various sized perforations in the brass work; while the third kind, called "iris" diaphragm, consists of plates overlapping one another, and making the aperture larger or smaller as revolution takes place.

The stop performs several offices; it enables different planes of the picture to be brought into focus at the same time, and it also causes the picture to be quite sharp, even to its extreme edges. We do not say it is desirable to use this power placed in our hands on all or even many occasions, as beginners are very apt to do, but we ought to know what power we have and we can then intelligently use it as we have occasion.

The smaller the stop used, the darker, of course, grows the image and the longer the exposure, it being taken as a guide to exposure that each smaller stop increases the exposure twofold.

Should the beginner feel uncertain as to what is meant by the use of stop to bring planes into focus, by the following experiment he will easily find out:

Let him place a group of figures some little distance, say twenty yards, from a bank of trees and shrubs. Let the figures be dispersed thus: some sitting on a rug on the ground, some sitting on a bench behind these, and others standing somewhat further back still behind these. There will now be four planes or distances in the picture—the row sitting on the ground, the row on the bench, the standing row, and the trees and shrubs in the background.

It will probably be found that if the first row be focused, the back row will not be sharp and the background quite astigmated; if the background be focused, the figures in front will be, on the other hand, quite indefinite.

Now let us focus the row standing up until we get them quite sharp, and then proceed to place *f*/11 in the slot; if this be not successful to bring all into focus, then *f*/16, and so on until all the rows of figures and the background are quite sharp.

We have not here discussed the question whether it is desirable that the background should be sharp in such a case, but only used the group as an illustration to explain the action of stops in sharpening up several planes at once.

It is far better to focus thus for the middle distance and so sharpen the distance and foreground at the same time, than to focus the foreground and sharpen up the distances from that, and manifestly a smaller stop will suffice for our purpose, which is a consideration when there is movement possible in figures or foliage, which might spoil our picture.

The same remark applies if you have to tilt the camera and use the swing-back as mentioned above to get in the whole of a building, so that the top and bottom are greatly out of focus.

In a case like this do not try to get the top or the bottom sharp, but the center, and gradually sharpen top and bottom at once by the introduction of stops, in which way you will manage with a much smaller one than you otherwise could, and decrease, consequently, the necessary time of your exposure.

There is another movement which is not found in many cameras, nor often used, called the side-swing, by which without the use of stops we can do the same sharpening of objects which are out of focus across the picture as we can with the swing-back when they are

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the upright way of the camera. If you have it so, use it; but if you have not got it, you need not regret it.

It ought not to be taken for granted that if a subject be fairly sharp the introduction of a very small stop will necessarily give extreme sharpness. It will be found in practice that it will often throw out the existing focus, so that the picture should always be well examined after the introduction of the stop and before the plate is exposed.

The earnest landscape worker will soon find what power these two adjuncts to the camera place in his hands; how he can accentuate and suppress focus, sharpen or throw into indistinctness various portions of the picture as his taste and judgment dictate.

He will find that the more he is accustomed to the use of these helps the more power will he get out of them to vary his results to suit his artistic judgment.—*The Amateur Photographer* (English.)

PLATINUM PRINTING ON FABRICS, PLATINUM TONING, etc.

BY E. A. ROBBINS.

THE platinotype process can be very easily applied to the production of prints upon such fabrics as silk, linen, and satin. These should, of course, be free from grease and from dye (which might undergo a change in the acid bath), and wood can be sensitized and used for various decorative purposes. In the case of fabrics sizing is required, as in the case of paper, to prevent the sensitising solution from sinking into the substance of the fabric and so producing dull or flat pictures. The fabric is most conveniently manipulated by being stretched upon a frame of wood, which should be well varnished with shellac, such as is used by painters for canvas; the corners having wedges whereby the fabric can be stretched free from wrinkles, and when stretched the fabric is saturated with the size, which may be composed as follows:

Arrowroot	500 grains
Nelson's geletin	180 grains
Alum	110 grains
Water	120 ounces

or any other good size of comparatively hard quality. Great care should be taken that no creases are produced or allowed to remain in the fabric while drying. The fabric is allowed to dry upon the stretcher where it may remain until after the sensitizing operation. The sensitizing solution is the same as that used for paper, one giving considerable contrast being preferred. The sensitizing solutions ready for use can be obtained from The Platinotype Co.

The sensitizing solution is most conveniently applied by means of a flannel ball enclosing cotton wool, this being more suitable than the squeegee given in a former paper, as the fabric will sag on damping and the squeegee will not give an even coating. Care must be taken in the manipulations, as under too much pressure the surface of the fabric is easily abraded. When coated the fabric should be removed from the stretcher and be carefully dried, bearing in mind that the surface is easily scorched and spoilt. The removal of the fabric is necessary, as any solution between it and the wood would decompose and cause stains and marks. Printing is done in the usual way, frames having plate-glass fronts and screw pressure are recommended. A heavy equal pressure is desirable to prevent wrinkles forming or the image blurring through insufficient contact between the fabric and negative. For the same reason plenty of dry backing should be used, not omitting the usual piece of vulcanized rubber. Judging of the printing is rather more difficult than with paper, owing to the greater transparency of the support. This will be slightly improved if the rubber padding is white, but a little experience will soon teach the proper depth to which the print should be carried, or it may be determined by the use of an actinometer.

The development is the same as for paper, the fabric being either wholly immersed in the solution or run backwards and forwards under a glass rod under the solution. The latter method is of use when the fabric is much larger than the developing dish, but is not recommended on account of the difficulty of preventing streaks and bubbles. The prints are then transferred to an acid bath, this being repeated three times, after which the acid is removed by well rinsing in water, complete removal being of extreme importance. In the case of wood naturally only the lighter varieties are used, and the pieces must be well seasoned and perfectly smooth and flat. The size is applied by means of a soft brush or a ball of flannel, and the wood is dried under moderate pressure to prevent warping. The sensitizing solution is applied by means of a squeegee covered with sateen, and the wood carefully dried. The printing will have to be judged by means of an actinometer, as the nature of the support prevents the surface from being examined; the pressure should be considerable to produce absolute contact. The development should take place as soon as possible, and with a comparatively cool solution; the acid baths and washing as usual. The wood should be dried under pressure, and may be varnished or colored according to the fancy of the operator.

REDUCTION OF PLATINUM RESIDUES.

A few words on the reduction of platinum residues may not be entirely out of place. The richest source of platinum is the old developer, the water used for washing the measures, the squeegee, etc., used in sensitizing, and the paper cuttings. The acid baths contain very little platinum, only that carried over upon the surface of the prints, and which is too small a quantity to pay for its reduction.

From the developer—

To this add a saturated solution of ferrous sulphate, and boil for about fifteen minutes; filter this and heat the black precipitate left in the filter to a moderate degree with pure hydrochloric acid, to free it from any iron that may be present, well wash and convert into chloroplatinic acid by treatment with aqua regia, and thence to potassium chloroplatinite in the usual way.

The linen of the squeegee, the cuttings from the undeveloped prints, and the trimmings of developed prints, are all burned in a crucible, and the ashes mixed with three parts concentrated hydrochloric acid and one part concentrated nitric acid; the whole mixture is then gently heated for some hours at a temperature of 50 deg. —70 deg. C., it is then diluted with water, and the insoluble remainder well washed. From the liquid which runs through the filter in the above case, and also the wash water, platinum may be precipitated as ammonium chloroplatinite by adding strong liquid ammonia (·880).

On heating this precipitate to redness in a porcelain crucible, it is converted into metallic platinum, which can be reconverted into potassium chloroplatinite.

Platinum Toning.

This method of toning gelatino-chloride and albumenized silver prints has some advantages over gold toning, and is also capable of giving very fine results when the operations are carefully performed. The printing is carried out in the same manner as for gold toning, viz., the depth to which the print should be carried should be slightly greater than that required for the finished print, but not so far as to block out detail in the shadows. The prints must be kept as dry as possible, and all contact of the surface with the fingers avoided, else stains may be expected. The prints may be washed in changes of water until no opalescence is visible in the last, it is then advisable to pass them through a weak solution of common salt for a few minutes, to remove any free silver remaining. The following toning bath is due to Mr. Kidson Taylor.

Chloroplatinite of potassium	5 grains
Sodium chloride (common salt)	50 grains
Citric acid	50 grains
Distilled (or boiled) water	30 ounces

The bath will keep very well, and to renew its activity one grain of the platinum salt per twenty cabinet prints is required. The following bath is recommended by Lyonal Clarke, and is more rapid than the above stock solution.

Chloro-platinite of potash	60 grains
Distilled water	2 ounces

This will keep indefinitely.—*The Photogram.*

SKY AND LANDSCAPE ON ONE PLATE—A NOTE FOR YOUNG WORKERS.

BY W. THOMAS.

Under many circumstances it becomes not only possible, but quite a simple proceeding, to obtain a landscape with sky on the same plate, giving to each just that exposure needed to ensure the whole developing up without signs of under-exposure in the foreground or too ample exposure in the sky.

One result of working in this manner is to prevent ghastly examples being produced, with at least two distinct sources of light strongly *en evidence*, another being the excellent practice it offers for attaining some skill in manipulation while in field and when developing afterwards.

Walking along a weed and grass-grown strip of land skirting the River Blackwater, some time back, I thought to renew an oft-made experiment of attempting to render by one exposure a blue sky with masses of gray clouds floating across a hedgerow of dark green, and some rough foreground of grass and weed, with just a small pool of water reflecting the blue from above. On sitting down for reflection, over a pipe, it seemed, with the plate available and using a yellow screen, that six seconds' exposure for the landscape would be about ample, while the sky would call for not more than half a second. This being settled, and the camera rapidly put in position, slide drawn, and so on, the exposure was made by drawing slowly the blind shutter open until the landscape portion was exposed fully to the light's action, then giving the rest a flash. This roughly represented about three seconds to the foreground, and, say, a quarter of a second to the sky. Taking the opposite string, the same slow pull was given, and finishing again rapidly when the sky line was reached, which concluded the graduated exposure decided upon. For this kind of work, or, indeed, any, in the open, a simple blind shutter, such as sold by Place or Tyler, will be found quite as handy to use as a cap when giving lengthy exposures, or perfectly effective when fairly rapid work has to be done, always assuming the camera is fixed on its tripod.

The plate used on the occasion referred to above was a medium speed isochromatic, and No. 1 pale yellow screen behind the lens working at *f*/16.

On making a start to develop, a weak solution at first had to be employed until all the detail had satisfactorily been brought out, for the reason that much density in the small pool of water in the near foreground was undesirable, as also in the lighter portions of the sky. When the whole had developed out, a little more pyro being added, and a further trace of bromide, brought this negative quickly to printing density, the result being highly satisfactory, as to the rendering of gradation throughout, the print when made showing blue sky as gray, the clouds with full modeling, while the landscape portion came soft without dark patches of unbroken shadow, and finally the pool of water, instead of being shown as a patch of white, is toned to a light gray. Looking at the original negative, and a platinotype print from it before me now, shows these matters in marked manner, but whether the reproduction accompanying this note will equally render them I am unable to foresee; but the experiment is easy for you to try yourself, while the command such practice will give to you over the tools necessary to employ in photographic work will more than repay repeated attempts being made at truthful rendering of the many tones found in every landscape.—*The Amateur Photographer* (English).

Metal Vases and Articles with a Highly Polished Surface are as a rule difficult to photograph on account of the reflections, which give very hard dense patches in the negative. This can be avoided in several ways. A piece of soft well-kneaded putty dabbed or rolled over the surface will give a soft matt appearance, which photographs well. The putty will rub off easily and in no way damage the most delicate surface. Another plan is to place a screen of tissue paper or ground glass between the light and the object, this answers well in many cases and is less trouble than the foregoing. Again, a piece of ice placed inside a small cup or vase will cause the vapor in the air to condense on the surface and make it dull and thus a satisfactory photogram can be obtained.—*Photogram.*

Rapid Filtration.—A piece of chamois leather forms one of the quickest filters for straining syrupy solutions that would refuse to pass though ordinary filter paper. The leather should be well washed in a weak solution of soda, to free it from grease, and then rinsed thoroughly in clean, cold water. A pint of the thickest syrup will run through a wash-leather filter in less than five minutes. It should be well washed after use, and will then last almost indefinitely.

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NOTES.

The Photographers' Association of Pennsylvania will hold their second annual convention at Bellefonte, Pa., on February 23, 24, and 25, 1898.

The French Societe d'Encouragement pour l'Industrie Nationale has awarded the Giffard prize of one thousand francs to M. Ducos du Hauron for his work in three-color photography.

Through An Oversight, we gave credit to *Cycle and Camera*, published in England, which was due to our American contemporary *The Photo-American*. It was originally written for, and published by the latter publication, but had been reprinted in the former.

Invention, Originality, Mannerism.—Leslie very properly points out that invention is not the same thing (in art) as creation, but is rather combination. Creation in its ordinary sense is only possible to a *very* limited degree in pictorial art. It very readily tends to run into either the false or the monstrous, *i.e.*, depicting of monsters, grotesque or repulsive. Another great danger of attempting creation is the production of a mannered art.

"The Photographic Instructor," for the Professional and Amateur. By W. I. Lincoln Adams and Charles Ehrmann. Sixth Edition—Eighth Thousand. New York: The Scovill & Adams Company of New York.

Still another edition (the sixth) has been demanded of this popular instruction book, which brings the total sales up to eight thousand. This fact speaks louder for the practical value of the work than anything we might say.

The present edition is in paper covers, at the popular price of $1.00, so that it will be within the reach of all.

A Feature of "R. M. & W." Printing Out Papers that artists generally can appreciate is the absence of arbitrary conditions regarding the kind of negative to be used. Special negatives are not required. The artist simply makes the best negative he can, prints slightly deeper than for a gold tone, and tones in the gold bath only long enough to develop the high lights clearly. The result of this manipulation is that roundness, brilliancy, depth and softness so much desired by the up-to-date photographer and so pleasing to his patrons. Further "R. M. & W." papers do not bleach in the toning bath, and the same negative can be used for both glace and matt surface. In the production of their Victor and Vera, the Reichenbach, Morey & Will Co., seem to have fully considered every requirement and to have produced a satisfactory reply to every question suggested by the most advanced photographic practice in relation to printing out papers.

The G. Cramer Dry Plate Works are sending out the following letter:

"St. Louis, Sept. 1, 1897.

"We feel that an explanation is due our many friends, who have suffered inconvenience on account of our failure to fill their orders with the customary promptness.

"There has been a phenomenal increase in the orders for Cramer plates during the last three months, so that at the present time the demand far exceeds the supply, and we are way behind in filling our orders.

"However, we are at the present time busily engaged in enlarging our capacity, and are pushing matters to completion with all possible dispatch. When the improvements which we are making have been completed, we hope to be in a position to fill all orders regularly.

"Thanking you for your valued patronage and craving your indulgence for a short time longer, we remain,

"Yours Fraternally,

"G. Cramer Dry Plate Works."

Platinotype Print—To Clean.—Most photographers have observed the curious predilection that photographic prints (of all kinds generally, and those on rough paper especially) have for gathering dirt. The following hint of how to clean a rough-surface print may prove useful. Make of flour and cold water a fairly thick paste of about the consistence of cream. To this add a small quantity of common alum, say half a teaspoonful of alum to a breakfast cupful of flour. With a spoon and pudding basin rub all together into as smooth a paste as possible. Now with a soft brush apply this paste all over the print and wash off again under the tap, when it will be found that the paste has gathered up the dust and dirt out of the grain of the paper, and the print comes out as fresh as the day it was made.

N. B.—Use plenty of paste on a very soft brush, or you may slightly abrade the more delicate tones of the print.—*A. P. Note Book.*

Relief, Breadth, Repose.—These three desirable qualities in a work of art are very largely due to the chiaroscuro or arrangement of light and shade.

Relief is due to the *contrast of light and shade*, for you cannot get two equal shades to stand out or separate one from the other; one to relieve the other. Relief is more needed in a large than in a small work, and especially if it be intended to be viewed from some distance.

Breadth is due to extending more or less even lights and shades, *i.e.*, large patches devoid of great contrast,

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From "Photograms of the Year."

JADIS

By ALFRED WERNER.

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but not flat or devoid of gradation. Breadth is quite *necessary to give unity* to the whole work, and is the invisible chain linking the several parts together.

Repose is to a large extent *a matter of simplicity of design*, and is the result of so arranging matters that there are few striking or attractive outlines, the outlines for the most part merging into and being absorbed by the adjacent shades and shadows.—*A. P. Note Book.*

Robert E. Dietz.—We regret very much to learn of the death of Robert Edwin Dietz, who died at Hempstead, L. I., recently. He was born in 1818 in this city, on the corner of Spring and Crosby Streets, in a house built there by his grandfather, who came to this country during the revolution, and who kept a tannery on the corner of Wooster and Spring Streets. He was also the first manufacturer of glue in this city, his works being located in Magazine Street, which is now that part of Pearl Street between Broadway and Chatham Street.

The present R. E. Dietz Company, of which R. E. Dietz was founder and former president, occupied, until its recent destruction by fire, a large building, erected by him on Greenwich and Laight Streets, with branch houses at Chicago, Ill., and at London, England.—*From the New York Evening Mail and Express, Sept. 20th, 1897.*

At the recent P. A. of A. Convention, the matter of recognizing the valuable services of old Mr. Jex Bardwell, years ago, in supplying the evidence necessary to defeat the bromide patents, was brought up, a collection was taken and a subscription started for amounts from $1.00 to $10.00 to secure him and his invalid wife a home in some institution for the remainder of their lives.

As is generally known, Mr. Bardwell gave the desired evidence in his possession without charge, at considerable cost of money and time to himself, thereby saving to the photographic fraternity and their descendants, thousands of dollars. For those who have not yet subscribed, the opportunity is now presented of contributing towards the discharge of an obligation beyond computation as a matter of justice to one who is entitled to more than he can ever hope to realize.

G. Cramer, Orville C. Allen, George Steckel, J. Edward Rosch, Edward L. Wilson, C. M. Hayes, J. F. Ryder, Wm. H. Allen, Committee.

You are requested to help in this noble cause by sending any amount you desire to give, to William H. Allen, Treasurer, 247 Jefferson Ave., Detroit, Mich.

A Special Meeting of the Officers of the Michigan Photographers' Association was called at Detroit, on Wednesday, September 28, 1897. The officers present were: J. E. Watson, President; A. J. McMichael, First Vice-President; W. L. Smith, Treasurer, and E. S. Tray, Secretary. Ex-President Hayes of the National Association was also present. The meeting was called to order by President Watson and the following list of prizes was decided upon:

Prize List: To Photographers outside of Michigan, Special Prize, Class "A"; for best portrait, one picture, $20 in gold, 1st prize. Silver medal, 2d prize. Genre Class—Class "B"; one picture, $20 in gold, 1st prize. Silver medal, 2d prize.

Prizes for Michigan only: Grand Prize, Class "A"; four pictures, ten inches and larger, one gold medal, 1st prize; one silver medal, 2d prize; and one bronze medal, 3d prize.

Class "B"; 12 pictures up to ten inches, one gold medal, 1st prize; one silver medal, 2d prize; one bronze medal, 3d prize.

Class "C"; 12 pictures. No restrictions as to size from towns of 3000 and under; 1st prize, silver medal; 2d prize, bronze medal.

Class "D"; Landscape. Six pictures, any size, one silver medal.

Class "E"; Marine Views. Six pictures, any size, one silver medal.

Class "F"; Interior. Six pictures, any size, one silver medal.

Class "G"; Commercial Work. Six pictures, any size, one silver medal.

Scientific Photography—Open to all. One picture, one silver medal.

X-Ray Photography. One picture; one silver medal.

Microscopic Photography. One picture, one silver medal.

Genre Class. Two pictures, any size, 1st prize, one silver medal; 2d prize, one bronze medal.

Special Prize; Amateur Photography. Three pictures, no portrait, 1st prize, gold medal; 2d prize, silver medal; 3d prize, bronze medal; 4th prize, diploma.

Entry fee, $1. A. G. McMichael, 1st Vice-President, Detroit, Mich., will have charge of special prizes for photographers outside of Michigan. All correspondence concerning these prizes should be addressed to him. W. L. Smith, of Saginaw, will have charge of the special prizes for amateur photographers.

The Third Annual Convention of the Michigan Photographers' Association will be held at Jackson, February, 1898.

A Salon and Exhibition will be held by the Detroit Camera Club at the Detroit Museum of Art, Detroit, Michigan, on November 18, 19 and 20 next. For full particulars and entry forms address Mr. O'Brien Atkinson, Secretary, 17 Rowland Street, Detroit, Mich.

Mr. W. E. A. Drinkwater, in the *Photographic News*, gives a paper on the subject of "Lantern Slides by the Carbon Process." After an exhaustive description of his methods for producing lantern slides, he condenses the salient points in carbon printing as follows:

"All sensitized tissue must be kept flat under a weight to exclude both light and air.

"New tissue gives stronger contrasts than old.

"Old tissue prints much quicker than new.

"Tissue sensitized on a weak bath is much slower in printing than that sensitized on a strong bath.

"The action of light, once started, continues in the dark, therefore never expose the tissue to daylight at all (however weak), lamp or candle light only.

"A warm, damp atmosphere is very conducive to insolubility setting in, and in such weather the tissue rapidly becomes quicker-printing with a tendency to flat results and evil."

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"A warm, damp atmosphere also helps on the continuating action of light when once started, and in such weather development should very speedily follow printing.

"Small quantities of ammonia in the final washing of hot water tend to brighten up the picture; and, to some extent, remedy the evils arising from over exposure or stale tissue.

"Ammonia used to excess has a strong solvent action on the gelatine, and will quickly destroy the delicacy of the lights and half-tones.

"Bear these maxims in mind, and their bearing on each other, and your lantern slides in carbon will be a success.

Stereoscopic Opera Glasses.—Messrs. Zeiss, of Jena glass fame, have, according to the *British Journal of Photography*, devised an opera glass of novel construction. It was recently pointed out in these columns that beyond a certain distance from a twin-lens camera, stereoscopic effect was not produced, and the same principal governs the action of the eye. Except by reason of practised judgment in comparing objects of known size, and to knowing distance or relief intuitively, the eye is incapable of itself of distinguishing between different planes beyond a given point. As a matter of course, there is no limit to the distance at which stereoscopic effect can be produced if the lenses are separated to a greater distance. This effect Messrs Zeiss have taken advantage of in their new instrument. The object-lenses of the tubes of the opera glass are placed at the side instead of, as usual, at the ends of the instrument, which is made to open out into one straight line and so throw the lenses some distances from one another, and by means of an ingenious arrangement of prisms the rays passing through the objectives are bent back so as to arrive at eyepieces fixed the usual distance apart. By this means it is quite easy to see the view over a wall much higher than the spectator, or for him to hide behind a tree and project his lenses on each side of the trunk and enjoy the view beyond as though he observed it in the accustomed manner. The great advantage, however, that the new arrangement possesses is that, when the lenses are well separated, distant objects are seen with true roundness, and planes of varying distances are appreciated. For military purposes the new form will be valuable in enabling distances for training artillery to be better appreciated, as also the actual depths from back to front of bodies of troops at a distance. There can be little doubt that the idea of the new instrument has been suggested by the method of old stereoscopic workers of removing the camera between the two exposures to points some distance apart when distant objects were being photographed for stereoscopic views.

"Sunlight and Shadow." A Book for Photographers, Amateur and Professional. Edited by W. L. Lincoln Adams. Illustrated. New York, The Baker & Taylor Company.

In his little handbook entitled "Amateur Photography," which has had such a phenomenal sale (being now in its fourth edition and 500oth). Mr. Adams gives his readers practical guidance in the very first steps of photography. The present handsome volume is designed to help the more advanced photographer in his endeavor to produce artistic results both in the studio and out of doors. He assumes that the purely technical matters of exposure, development, printing, etc., have been substantially mastered, and that it is now the desire of the worker to improve himself (or herself) in the artistic side of photography, though the author does not omit the practical instruction necessary to accomplish the highest pictorial effects.

Mr. Adams has added to various articles and illustrations of his own, carefully selected papers and pictures by the leading photographic writers and workers, both of England and America. These have all been arranged in systematic order and formed into a complete book, which entirely covers the various departments of pictorial photography. There are fourteen chapters in all, on the following subjects:

CHAPTER I.—The Choice of Subject; II.—Landscape without Figures; III.—Landscape with Figures; IV.—Foreground; V.—The Sky; VI.—Out-door Portraits and Groups; VII.—The Hand Camera; VIII—Instantaneous Photography; IX.—Winter Photography; X.—Marines; XI.—Photography at Night; XII.—Lighting in Portraiture; XIII.—Photographing Children; XIV.—Art in Grouping: which gives an idea how completely and well the entire subject is covered by this useful book.

The illustrations are over one hundred in number, including initial letters, vignettes, tail pieces, etc., and are selected from the best work of the various photographic artists who were invited to contribute them, among whom we may mention such well known names as H. P. Robinson, Alfred Stieglitz, J. Wells Champney, W. A. Fraser, Xanthus Smith, R. Eickemeyer, Jr., the Marquis de Alfarras, Her Grace the Duchess of Sermoneta, W. B. Post, B. J. Falk, and others equally prominent. Many are full page pictures, some being printed on only one side of the paper, while the initial letters, vignettes, etc., are scattered throughout the entire volume.

The book is printed on the heaviest wood-cut paper, which brings out the beautiful qualities of the photo-engravings to the very best advantage. It is printed from new type, large and clear, with liberal margins and spaces between, and is most handsomely and substantially bound in art canvas, with gilt design stamped on the cover, and with gilt edges. Altogether it makes the most handsome photographic book which we have ever seen, and will, undoubtedly, soon find its way to the waiting-room table of all prominent professional photographers, and into the libraries of the leading amateurs and clubs. The sale of advance copies, we are told, is already very large. It can be obtained from our publishers, or of any dealer in photographic materials, or book store. Price, $2.50, in a box. Post free, by mail.

How to Make a Brilliant View Meter and Finder.—Get an old bi-concave spectacle lens. One generally has one or two of these knocking about from old spectacles; if not, an optician will provide you with one for a few pence. The focus of the lens does not matter. Then determine by looking through a small hole in a piece of card with the lens behind it, how far off the lens has to be from the card so as to take in the

same view as your camera does, having first placed a small mask of black paper over the lens, having a rectangular hole cut in it, the sides of which bear the same ratio to one another as do the sides of the plate used. Then make a small box out of thin wood, just so wide and deep as the spectacle lens, and as long as the distance you have determined before. Fix the lens at one end of the box (being covered by the small mask), and at the opposite end cut a circular hole about half an inch in diameter. On looking through this hole the eye being close up against it, you ought to see a brilliant image on the lens of the exact view that your camera takes in. It will be a great help for you if you cover the circular hole *inside* with a piece of blue glass, which renders the view in monochrome, and so makes it much easier to judge of how the view will look in a photograph. If you work with several lenses you can easily arrange the spectacle lens so that its frame moves up and down the box, and you can have a piece of wire sticking up from it, and working in a slit in the top of the box with a scale beside it. With this arrangement you can tell how much a certain lens will take in, or what lens you will have to use to get a certain view; and by fixing it to your camera, so that you can take it off or put it on at will, you can use it as a finder, the image always being brilliant and well lit, even in the brightest sunshine.

This finder has many advantages over the usual ground-glass or the "brilliant" finders sold now with most hand cameras, which give different views according to the distance at which you view them. But with the one described this cannot happen, as the distance is fixed by the hole in the box for each lense you use. And also you can use it with a hand camera by holding the camera under your chin, which is the best position for it, both for steadiness and for the view it takes in, which is much truer than one taken from a yard or so from the ground, as is the position of the "look-down" finder.

If made tapering down to the circular hole the finder has a much neater appearance.—*Photographic News.*

Silhouette Photography.—Photographic silhouettes writes J. McConnell Sanders in *The Photographic News*, may readily be produced by means of an ordinary camera in the following manner. Let the sitter be placed close to a well-lighted window containing large panes of glass. The head should occupy, as near as possible, the center of the pane, and should be allowed to rest against the glass in such a manner that the profile can clearly be seen on the focusing screen of a camera placed at a convenient distant away. The following points should be observed:

1. No light should enter the room by other windows than the one under operation.

2. There should be no objects outside this window close enough to be "in focus."

3. The sitter's head should be focussed as sharply as possible, so as to present the appearance of a silhouetted profile on the screen.

The exposure should be made with a small stop (*e.g.*, *f* 22), and should be *short*—about half that requisite for producing the portrait of a sitter in the ordinary way, when well illuminated with the light under consideration.

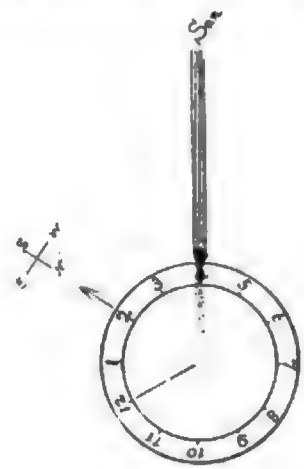
The plate is developed in the ordinary way, but development should be stopped before any details beyond the mere profile have made their appearance. If necessary, the negative can subsequently be intensified. Before printing from the negatives they should be "finished off" at the bust by means of a little dark-colored pigment, applied so as to produced the appearance shown in the illustrations.

Printing is best performed on matt surface P. O. P, subsequently toned, first with platinum chloride, then with the ordinary "combined bath."

Such silhouettes can be tastefully mounted in oval or circular minature frames, or can be cut to fit into lockets or watch cases.

A seasonable suggestion would be to mount them as Christmas cards, and if used in anticipation of a visit to a friend, they would correctly illustrate the appropriate motto:—"Coming events cast their *shadows* before."

Architecture, and Points of Compass.—*The proper title of this note should be, "How to tell the points of the Compass by means of a Watch when the sun is shining—a note for Architectural Photographers."* It is often a matter of very great importance to be able to determine the compass points of a building so that it may be visited at such an hour that the sun may be in a certain position. Thus compass points may easily be found if only the sun is shining, or even its position be known, *e.g.*, behind a cloud, if one has a watch which is going to time. Take any small object, say the point of a pencil, and hold it at the side of the watch opposite the hour at the time. Let it be four in the afternoon,



for example, as shown in the accompanying figure. Now holding the watch more or less horizontal, turn about until the shadow of the pencil falls from the figure four to the center of the watch. Then half-way between the direction of the sun and the position of twelve on the watch is south. In this case it will be opposite two on the watch. The reason of this matter will be obvious when one remembers that the sun goes just half as fast as the hour hand, *i.e.*, the sun goes round the watch once in twenty-four hours, but the hour hand goes round every twelve hours. Suppose now it to be twelve noon, when the sun is due south. At that moment the figure twelve, the sun, and south point agree. In one hour the hour hand will have gone one-twelfth of the circle, while the sun has only gone one-twenty-fourth of its circle. If,

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therefore, we point the figure one on the watch to where the sun now is, half the distance between that figure and twelve will be the south.

Or we can arrive at the same result in a slightly different way. For example, suppose the time to be now 5 o'clock. If we take just half this time from noon, *i.e.*, 2 30, and point 2.30 on the watch to the sun, then 12 o'clock will be opposite south. Similarly if the time be ten in the forenoon, there are yet two hours to noon We must therefore point the one, *i.e.*, the figure eleven towards the sun, and the figure twelve will point south.

Focusing in Dark Interiors.—The difficulties of focusing in dark interiors are familiar to all who have attempted this class of work. The difficulties arise from various causes, and various expedients have been suggested, such as using a candle flame, sheet of large print, etc. But after having obtained a sharp focus with a fairly large stop, the difficulty arises about adjusting it when a stop sufficiently small to give the required depth of focus has been inserted, for now little or nothing can be seen on the ground-glass.

The subjoined table (which was first worked out and published by Rev. F. C. Lambert) will be found of considerable assistance when once the method of its use has been grasped The following explanation, by means of an example or two, will easily make this clear.

TABLE TO ASSIST FOCUSING.

	5	10	20	50	100	500	INFINITY.
5	·	7½	8	9	10	10	10
10		·	13	10	18	19	20
20			·	28	33	38	40
50				·	66	91	95
100					·	166	185
500						·	666

Suppose that the nearest object we wish to include in the picture is situated about 10 ft. away from the camera, and that the most distant object is, say, 50 ft. away. Now to get depth of focus sufficient for this case such a small stop will be required that probably very little or nothing will be seen on the ground-glass, and when the open aperture of the lens is used only a very limited area is in anything like sharp focus. But if only we knew what point to focus for with the open aperture of the lens so that when the small stop was inserted the depth of focus would cover the nearest and most distant points, then all would be easy. This is what the table aims to tell us. Glancing along the left-hand column we see the figure 10. Now run the eye along the corresponding horizontal line of figures, until under 50 on the top line we see the number 16. This tells us that if we focus for an object 16 ft. away, and then insert a sufficiently small stop, we shall get the points 10 and 50 ft. equally sharp Thus we may take the left-hand vertical column for the distance of the nearest object, and the horizontal top line of figures for the most distant object. Then the figures at the point where these two columns meet give us the point to focus for, so that the two other points nearest and most distant may be equally sharp with a small stop. Another example: Suppose that the nearest object be 20 ft away, and the most distant be 100 ft. away, we see that where the two horizontal and vertical columns meet we have 33 ft. as the point to focus for. Thus according to this table the old rule of "about one-third" does not hold good. Thus for two points, 10 and 20, we focus for 13 ft.; for 10 and 50, the focus point is 16; for 10 and 100, we aim at 18; for 10 and 500 at 19; and for 10 and infinity we aim at a point 20 ft. Thus the table becomes of service to the *hand-camera* man who wishes to use a small stop to include a certain depth of focus, and has no focusing screen. In that case he would simply adjust by the graduated scale for the focus point, and insert a sufficiently small stop.

[Note.—This table gives no hint as to what stop must be used—only the point to focus for without the stop.—*The Amateur Photographer* (England).

Developing Over-exposed Plates.—"Development a difficulty? my dear sir—not a bit. You just adopt my formula, work it as I work it, and it is as easy as A B C. Over-exposure matter? Not a bit. Under-exposure? Not a bit. You just adopt my system, and you are as right as the Bank. Look here, old man, on your way home, you just call at Deppow's, and get the things, and make some exposures. Deppow will show you how to do that. I'll develop you the first dozen, and you'll be delighted. I'll call round to-night." It was Faiks who was speaking, and luring his friend in the direction of photography. You see, Faiks was a prominent member of the local society, had won a medal or two, and having invented a new developer, never tired of pressing it upon any unfortunate listener he could secure. Faiks's friend listened, and fell—that is to say, he called at Deppow's, bought a complete outfit, had the whole art and mystery of exposure explained, and had not left the shop many minutes before he was seized with a burning desire to have a shot at something, anything, no matter what. The desire grew stronger and stronger, and only with an effort, almost superhuman, was it repressed until he arrived at home—and then he was entirely overcome. In about as many minutes he had exposed four plates—carefully, and fully in accord with Deppow's instructions Then again, he was seized with the spirit of unrest; there was a feverish anxiety to know what he had got, and his thoughts reverted to Faiks and his generous offer, and his wonderful developer, and beautiful system. And, as luck would have it, Faiks called in, and took away the slides, remarking: "All right, old man; I shall be delighted to develop them; you know with my system I always get a perfect negative, always." Faiks returned home, had his supper, repaired to the dark-room, compounded his wonderful developer, and started on his variation of "tentative" development. And darkness came over the scene, and came so quickly and so effectually that Faiks could not see his lamp through the plate. "Hem, over-exposed awfully," he softly mused to himself, his confidence little abated. "I'll try soaking in bromide," he murmured gently, but firmly. Plate number two was brought face to face with expected salvation in a bromide bath, and was rocked gently and patiently for half an hour. The feet of Faiks grew cold, and his wife (good woman as she was), from the head of the

stairs, instituted kind enquiries as to probable time of retirement, and he said: "Never mind," and said it in a tone impossible to convey in mere type, or even through the medium of an illustration. He poured off the bromide, applied the developer to the plate; the latter hesitated and turned pale, pale grey, just at first, then it gained confidence, and density, and the grey deepened into darkness, and into a blackness that might have been felt, and there was no sign of a picture. Faiks was not very excitable, but he was very vain. His vaunted developer, his system, and his promises to his friend, all passed through his mind. His reputation was at stake. He possessed that quality which in man is usually called determination, in women obstinacy. He knew no such word as "fail," as they say of heroes. He stole stealthily—good word—to the scullery, annexed the roller towel, wet it under the tap, and applied it gently but firmly to his throbbing brow, lighted his pipe, drew at it viciously, and commenced to wade through the almanacs. Already he had spoiled two plates, two out of four. "The very thing," he exclaimed, as he found "Citrates as restrainers," and read the article; and first he thanked Mr. Webster mentally read the article again, and thanked Mr. Webster aloud, gratitude welled in his bosom, and his reputation—sometimes vulgarly known as "bacon"—might yet be saved. Even two negatives out of four plates, and his friend would be happy. Happy friend—happy, happy Faiks. But alas! the third was no better than the others: it might have been a beautiful negative if the exposure had been made upon a sheet of mourning notepaper. An utterly dense center, with a beautiful clear margin, showed where the delicate constitution of the bromide of silver had been protected by the rebate of the dark slide.

Faiks resolved not to deal with the fourth plate. His friend could get that developed elsewhere, anywhere, where the Dickens he liked. He went to bed, but not to sleep; all night long he tossed and wondered—could it be his fault? If so, where? His light was safe, his dishes were clean, and so were his measures. His developer was right, and his light was safe, for had he not clean rebates. Poor, restless Faiks. He called next day upon his friend, and went into a long explanation. He restrained his developer, he used bromide, he used citrate, and he had never never such a thing occur before, was awfully sorry, you know, really can't understand it, old man." Seeing his deep agitation, his friend begged Faiks to be seated. His friend also took a seat, crossed his legs, rolled a cigarette, and lighted it, and at the same time saying between the operations. "Well really, old boy, don't worry yourself so, don't worry, yourself. I really didn't expect a lot, because, you see, after I made the exposure in the garden, I naturally felt curious, and I just had a look at the plates. And I really couldn't see anything on them myself, so don't worry, old man."

Faiks eyed his friend steadily, but said never a word; language failed him.—*Photography.*

Luminous Phenomena Observed on Mountains.—Mr. C. G. Cash writes to *Nature*: On Easter Monday, 19th ult., I was ascending Braeriach by its well-known northern ridge, and, shortly after I had crossed the "snow line," I witnessed a phenomenon of great beauty, the explanation of which I cannot give: The edge of my plaid, of my gloved hands, of my knickerbockers, etc., was bordered by a two-inch band of brilliant violet light, at the moment of beginning any movement. The light was not visible around anything at rest, nor did it persist, but only showed at the moment when rest was exchanged for movement. My attention was directed to this for a very short time only, for heavy snow began to drive in my face, and I had to watch where I was going, as the immediate surroundings included dangerous ground. After my return, I found an account of a somewhat similar appearance in the *Cairngorm Club Journal*, vol. i. p. 159. I copy the account as there given by Dr. John Gordon, of Aberdeen: "Half way across the snow slope, while the sun was somewhat obscured, but was still sending a considerable intensity of light, we observed a strange phenomenon. On the side of our body next the snow slope, there was a nimbus of violet light, which clung to clothes, naked fingers, and the shaft of the ice axe. So plentiful did it appear in the palm of the hand that it looked at times like a pool of violet ink, and one thought it could be pitched away. On shaking the hand, however, the nimbus clung, and was not to be removed. Occasionally the color varied, taking on shades of brownish-yellow, and blue, but violet was the most marked color. At another time, in much the same condition of light and snow surroundings, one of the party, who was very proud of the beauty of the silver case of his compass, was disgusted to find that it had a distinctly yellow, pinchbeck look. This light refraction or polarization [?] was not so evident to some of the party, but the writer has observed it before in similar circumstances and atmospheric conditions." I may add that in my own case, no direct sunlight reached me, as I was in the lower part of a dense cloud of mist. Some of your readers may offer an explanation or this remarkable and beautiful appearance.

The Grain of Dry Plates.—R. E. Liesegang, in the current number of the *Photographisches Archiv*, states that he investigated the question of the grain of dry plates shortly after Schumann, Ostwald, and Gaedicke, who by chance referred to the size of the grain in negatives, and the relation to the sensitiveness of the plates.

Schumann, who has now been obliged by his physician to discontinue all work, determined that the grain of the negative need not correspond to the grain of the original silver bromide grain. This was of special interest, because in his spectroscopic work he required extremely fine-grained negatives in order to enable accurate movement of the lines to be done. He exposed a plate cut into three parts and developed the first in a normal pyro developer. For the second a small quantity of bromide of potassium was added to the developer, whilst for the third part a considerable quantity of bromide was used.

The well-known action of the bromide was at once manifest, as the third section was much more full of contrast than the first. At the same time a hitherto unknown action of the bromide was seen, which perhaps helps only secondarily the increase of the contrast. The first section was so fine-grained that the grain could only be detected with a microscope. The third section was so coarse-grained that the particles of silver were

actually separated by spaces of clear glass, and had the appearance of the grain of a half-tone block. The second section had a medium grain.

The original grain can be enlarged by the addition of potassium bromide, and Schuman believed it correct to assume that some of the silver bromide dissolved in the potassium bromide, and that the developer reduced the dissolved salt and that the nascent silver was precipitated as in physical development on the silver grains of which the image is composed.

It may also happen that the enlargement of the grain may be caused by the prolongation of the development by the bromide, for Liesegang states that he has already pointed out that in prolonged development with an alkaline developer the grain may increase just as the grain in a finished negative may increase by heating it. It should also be noted that Schumann used an emulsion very poor in gelatine, and, therefore, any action would be more pronounced than in an ordinary dry plate.

Later on, Gaedicke pointed out the possibility of another function of the bromide, for in the film of emulsion there are not silver bromide grains all of one size, but of very different sizes. The potassium bromide would then only destroy the action of light on the smallest grains, whilst the larger particles would be less attacked, and, therefore, be blackened by the developer. This would explain, moreover, the increase of the contrasts. To explain Schumann's phenomenon, another hypothesis was necessary.

Ostwald does not believe that the increase of light, sensitiveness of an emulsion need be dependent on the increase of the size of the grain. All compounds exhibit a tendency to enter into a more stable form, so that thelight-sensitiveness should thus actually decrease after the ripening. Ostwald, therefore, believed that the silver bromide gradually entered into combination with the gelatine.

Schumann has shown a very beautiful experiment, which proves the sensitizing action of gelatine. He coated half a glass plate with solution of gelatine, whilst the other half was left blank. He then placed it in a water bath in which finely divided silver bromide was suspended, and which settled regularly over the whole plate. Both parts of the plate were simultaneously exposed and developed, and the gelatinized half gave a normal, vigorous negative, whilst the half free from gelatine gave scarcely the trace of an image.—*British Journal of Photography.*

Iodated Salt—A Rapid Hypo Eliminator.—In the the current number of the *Bulletin de la Société Française de Photographie* appears a paper by M. P. Mercier upon a new salt which he has introduced for the rapid elimination of hypo, and which quickly eliminates the hypo without in any way affecting even the most delicate silver image. It possesses the property of destroying the insoluble variety of silver hyposulphite AgS_2O_3Na-S_2O_3, which is formed by incomplete fixation, and which cannot be eliminated by copious washing.

Most of the eliminators which have been proposed have not been much used in practice, because some of them stain the proofs, as in the case of permanganate, or else they attack the image, like chlorine and the hypochlorites, or else they do not act sufficiently, as in the case of some of the persalts recently introduced.

The iodated salt is satisfactory from every point of view, as it permits of the total elimination of the hypo in the case of proofs insufficiently fixed, and this may be proved by touching the whites of the prints with a brush dipped in a ten per cent. solution of silver nitrate there will be no yellow stain, proving the absence of hyposulphite.

The salt can be prepared by simply treating iodine with an alkali or alkaline salt, so that a colorless salt is obtained. With the alkaline carbonates or phosphates the decoloration is very slow, but it is immediate if ammonia is added little by little. Iodide of nitrogen is formed if ammonia be used, but this may be prevented by adding also a chloride as suggested below. Borates and sulphites may also be used instead of the carbonates or phosphates. In every case the iodine ought to be almost colorless before it is used, and in this condition it will eliminate the hypo without attacking the image at all.

All that has been said with regard to iodine applies also to bromine, but the bromated alkalies eliminate the sulphites less rapidly than the iodates, and they must be absolutely colorless, for with the slightest tinge of yellowness a solution will attack the image very vigorously.

It is difficult to state exactly what are the various compounds in solutions of iodine and bromine thus formed. According to the researches of Schoenbein, Lenssen, and Lewenthal, they contain the nypo-iodides, iodides, and iodates, but the two latter separately have no action on the hyposulphites. There are probably formed intermediate compounds which have no action on the silver image, but act particularly on the hyposulphites.

The preparation of the iodated salt is tedious, disagreeable, and certainly more costly than to purchase it ready prepared. For those who wish to prepare it themselves the following method may be adopted: mix in a porcelain mortar

Iodine	1 parts
Salt	30 parts

The iodine should be well rubbed down with the salt as this facilitates solution. A small quantity of potassium iodide will help it to dissolve, but it gives a reddish solution which decolorizes very slowly. An alcoholic solution of iodine may be used, and this can be obtained from any chemist as tincture of iodine, and thirty-six parts will be required to equal the dry iodine. Then to the above mixture is added

Carbonate of soda	30 parts

and the whole well mixed together; it should then be dissolved in 1,000 parts of water, and it may be used after twenty-four hours, or, if wanted in a great hurry, it may be gently heated on a water bath or decolorized by adding ammonia drop by drop.

A solution containing two per cent. of the salt may be exposed for a very long time to the air without undergoing any change, and a quart of it is sufficient for about twenty 7x5 plates, and when of this strength it requires for the total elimination of the hypo at least half an hour for negatives and positives on glass, five minutes for salted paper, ten minutes for bromide paper, fifteen minutes for albumenized paper, and one hour for gelatino-chloride paper. The prints may be left for

a long time in the bath, or the proportion of iodated salt may be increased without inconvenience; the image will not be attacked. The proportion of salt may be reduced for salted and bromide papers when the time of immersion is increased.

The negatives or prints should be rinsed for five minutes when taken from the fixing bath to remove the excess of hypo and then placed in eliminator and the dish rocked from time to time. It is advisable, when the bath has been used for some time, to use a second and new bath. The prints and plates should, after treatment, be rinsed for some minutes in water.

With imperfectly fixed prints an immersion of ten minutes in the iodate bath will eliminate more hypo than washing for ten hours in running water.—*The British Journal of Photography.*

"The American Annual of Photography and Photographic Times Almanac." New York. The Scoville and Adams Co.—Perhaps the best indication of the popularity of this annual visitor, is the fact that within a couple of weeks of the appearance of the 1897 volume, the first addition of 12,000 copies was almost exhausted, and the popularity is well deserved. It includes fifty original articles of more or less interest, led off by Mr. Alfred Stieglitz, on the hand camera, from which, no doubt, many will be surprised to learn that some of his well known and wonderfully beautiful pictures, that have been admired and medalled all over the world, are enlargement from hand-camera negatives. Chapman Jones calls attention to an old method of single transfer carbon printing, that if taken up by an artistic photographer and properly wrought, could not fail to bring him both fame and fortune.

The articles are followed by some thirty pages of well-selected formulæ, in which it is hardly possible for the photographer to want anything that he cannot find; the usual tables, time-saving as "ready reckoners," and a lot of general information.

But it is the illustrations that the 1897 *Annual* is especially strong. Hitherto, we have had to find fault not only with most of the annuals, but with many of the journals also for selecting illustrations, that, while they should have been examples worthy of being wrought up to, were, many of them at least, specimens of what to avoid. Here, we have over one hundred and twenty, fifty-seven of which are full-page pictures, and there are only two that we should have been glad to see omitted, "Brighter Than My Jewels" and "A Flower of the East." They are striking examples of the evil of scattering lights all over the composition, and the utter absence of that concentration so essential in portraiture. But to find only two faulty pictures in one hundred and twenty-seven is as rare as it is satisfactory, and we congratulate the editor on having made such a record.

Among the fifty-seven full-page pictures, Mr. A. Moreno easily takes first place, but whether with "The Awakening" or "The Gleaner" it is difficult to say. Both are perfect pictures; and put the stamp of a true artist on their author. Perhaps, on the whole, the greater simplicity with equally good effect, leads us to prefer the latter as the better of the two. They are the work of the Photochrome Engraving Company of New York, and are of the very highest order of reproduction.

The *American Annual* for 1897 is a triumph of the printers' and engravers' art, creditable alike to editor and publishers; a useful book of reference on photog. technique, and an invaluable source of inspiration to the student of art.—*The American Amateur Photographer.*

Conrad Kindermann was born at Lübeck in the year 1842, and apprenticed at 13 years of age to a cloth house in Riza, Russia. After having completed his five years of service, he still remained in the employ of the firm for an other year. He had a brother in Hamburg, an artist and photographer whom he visited at that time and who persuaded him to embrace photography as a profession. He entered his brother's atelier, worked there for six months, engaged afterwards with a photographer in Lübeck, and in the year 1863 went to work on his own account in the same city. He rented a studio that had stood idle for several years because of the scanty facilities to do good work. Its roof was so extremely low that a full figure of an adult could not be taken. Kindermann devoted himself mainly to the photographing of children, and laid here the foundation to the great reputation he has always enjoyed in that particular branch. The efforts made resulted favorably, and after another six months we find K. to improve and enlarge his gallery.

One of Kindermann's maxims has always been to improve by the work of others, and for that reason he has every year devoted a certain time to visit the foremost galleries of his fatherland and adjacent countries.

In 1869 Herr Banque, of Triest, came to Lübeck, visited K., and the two formed an intimate friendship, resulting in a partnership and an establishment in Hamburg. But business did not prove to be prosperous enough to support even one family, not to speak of two, and Banque retired from the partnership. Immediately after that business took a turn for the better; Kindermann made money enough to improve his establishment, and to surround himself with better facilities.

By that time his reputation as a photographer of young children was firmly established.

In 1881 he took a general agency for the Van Monkhoven gelatine emulsion plate, and was instrumental to introduce the dry plate in Germany more, perhaps, than any body else.

The photographic business on "Die grossen Bleichen" was carried on with more and more success, and when Kindermann finally found his locality to be insufficient to answer the demands of the public, he erected that palatial studio on the *Esplanade*.

The studios and laboratories there were perfect models, and every facility to do work was extant, but after a short time only, still more extensive enlargements were demanded, the rooms designed for domestic purposes soon merged with the working room, and a separate building was secured as a depot for the Monkhoven plates.

Kindermann is one of Germany's foremost artistic photographers, he is an amiable and polished gentleman, and knows how to make friends, and how to keep them. He has been intimately connected with the great *Deutsche Photographen Verein*, has been a member since 1881, and in the Board of Officers elected and re-elected every year since 1882.

His artistic efforts in photography have earned an excellent reputation.

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PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF SEPTEMBER, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

579,304. Photographic Camera. S. Ritter, Copenhagen, Denmark.

A camera is made up of a box or case provided with a funnel adapted to be moved into and out of the same. Hinged pieces are arranged at the ends of the slot through which the funnel can be moved, said hinge pieces being provided with spring clips, pins and guide-pieces.

589,346. Magazine Camera. E. E. Flora, Chicago, Illinois.

The casing of the camera is formed of telescoping sections, in one of which is pivotally secured a plate carrier or magazine. Mechanism is provided for raising the carrier or magazine to a vertical position by the inward movement of the sections, and to lower it to a horizontal position and release one of the plate holders by the extension of said sections.

589,349. Photographic Camera. L. J. R. Holst, Amsterdam, Netherlands.

This invention comprises a finding mirror behind the lens, composed of two parts, one of which is adapted to be elevated and the other depressed out of the path of the rays from the lens to the plate.

589,475. Magazine Camera. H. W. Locke, Rochester, N. Y., assignor to W. F. Carlton, same place.

The inventor claims a magazine camera having fixed side, bottom and top walls, a removable rear lid and a lower compartment. A door is adapted to slide through the rear into said lower compartment. A front upper compartment is provided and a rear upper plate or film holder chamber is arranged in line with said upper compartment but of lesser height and width, said chamber having a bottom plate separating it permanently from the lower compartment, a top plate extending forward a lesser distance than the bottom plate, and projecting studs at its front and sides. A sliding partition is arranged between said upper and lower compartments and slides rearwardly through the slot in said lid. Plate or film holders are provided having notched side flanges which are adapted to seat against said studs the front plate or film holder alone being then located forward of the front edge of said top plate, and with its notches below the corresponding studs. Sliding bars are located on each side of the said upper compartment, having on their ends arms which project beneath the bottom edge of the front holder, said arms having upwardly projecting lips forward of the front edge of the front holder, spring arms being carried by said sliding bars and projecting rearwardly to the rear of said chamber. A vertically movable slide is connected to said spring-arms and slides up and down, means being provided for operating said slide, and accessible through an opening in said rear lid, so that when said slide is moved up the front plate or film holder alone is elevated until its notches register with the studs, whereupon said front holder is free to fall down by gravity. A follower is located in said chamber back of the plate or film holder therein, and a spring is interposed between the same and said slide for forcing said follower against said holders.

589,649. Photometer. J. L. Fuelling, Peoria, Ill.

This invention comprises a main plate having a mirror-carrying frame pivoted at one end and adapted to fold down thereon, a pupil gauge being pivoted to the other end of said main plate, and also adapted to fold down thereon.

589,843. Photographer's Drying Rack. W. H. Lewis, Huntington, N. Y.

A drying rack composed of two frames pivoted together is provided with an auxiliary frame pivoted to one member of the main frame, and adapted to be swung into two positions, one at right angles to the member to which it is pivoted, and the other in the same plane with it

590,204. Roll Holding Flash Light Camera. J. E. Blackmore, Newark, N. J.

A camera is provided with a movable film and shutter for exposing the same, and also a chamber for containing a charge of flashlight powder. A hammer is provided for exploding the same and means connected therewith, and to said film for actuating both of them simultaneously. Means are also provided whereby the powder is exploded, and the shutter opened simultaneously.

590,632. Photographic Print Washer. F. Shurig, Huntingburg, Ind.

In a photographic print and negative washer, a wash vessel having an overflow connection at the top and provided with a dished conical bottom having a combined water supply and drain pipe connection at its apex. A downwardly dished false bottom is fitted within the vessel above the main bottom thereof, and provided with a multiplicity of jet openings whose sides are disposed at an angle to the vertical center of the vessel, the central one of said openings being larger than the others

DESIGNS.

27,497. Card Mount. J. P. Odgers, Philadelphia, Pa., assignor to the A. M. Collins Manufacturing Co., same place. Term of patent, seven years.

27,498. Card Mount. D. D. Dunklee, Greenfield, Mass. Term of patent, seven years.

Vol. XXIX.
FOUR DOLLARS PER ANNUM.
DECEMBER, 1897.
Number 12.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH ST. NEW YORK.

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A PERFECTED ARTICLE,

COMPARISON UNVEILS SUPERIOR MERIT.



An old Castle in Southern Tyrol.

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THE
PHOTOGRAPHIC TIMES.

VOL. XXIX. DECEMBER, 1897. No. 12.

THE PHOTOGRAPHY OF NATURE'S PHASES

BY MATTHEW SURFACE.

Author of "Photography as a Hobby."



By P. BERGON.

WHEN I first took up photography now more than twelve years ago, I had not the least notion at the time, of producing anything more than merely mechanical reproductions of whatever objects pleased me. The making of a picture by means of the camera was a proceeding quite outside my philosophy, and it was not until two or three years later that I was fortunate enough to see a genuine picture photograph.

Metaphorically speaking, it swept me off my feet. Such work as that was quite beyond my limited powers, I thought, and my interest in photography so far as personal labors were concerned subsided for a while. Later on, my courage returned, and I set out in real earnest to try and produce something better than the very commonplace bits which had hitherto satisfied me. I bought a lens of long focus (about 16 inches) and soon found that this was a great help in giving a truer perspective to the photographs I took. I worked away at simple subjects, such as trees, studying them under different lightings, at early morning, late evening, and midday, noticing how marked a difference in appearance the direction of the light brought about. I photographed them at all seasons of the year, and under many different phases, and my observations have led me to the conclusion that much good pictorial work can be done with the camera in simply following up the different phases of nature, her smiles and tears, her storms and sunrises. I also believe that in many of these subtle effects, the camera can do



THE RIVER'S BY-PATH BY MATTHEW SURFACE

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better work than the brush, for the face of nature changes so rapidly that before a painter could even sketch his outline, the particular effect would have passed away, and some other have taken its place.

To illustrate my meaning more clearly and to encourage other photographers in the same direction of study, I have chosen from my collection two of my earliest attempts showing broad aspects of river life which anyone who has patience enough to wait, and sufficient energy to seize the opportunity when it arrives, may imitate and improve upon, according to their individual capacity for the reproduction of nature by art.

"The Freshet" and "The River's Bypath" illustrate two phases in river life. The first shows the stream, high above its normal level, invading the roots of trees growing on the bank and sweeping forward with irresistible impetuosity. It speaks of a storm but just over, and of rapid torrents racing down steep hill-sides to swell the flood. Brushwood being carried along is seen on the right and left, while amid stream in the middle distance is a post almost completely submerged, which marks the end of a fence usually high and dry.



THE FRESHET — BY MATTHEW SURFACE

The second picture is the antithesis of the first. The river, no longer endowed with strength and volume, runs quietly along on the other side of the great bank of pebbles which it has accumulated, a museum of specimens from which the geologist might read many a story, while its safety-valve, used only in times of flood, has become a peaceful pool. The bare roots tell of a once powerful current, the white, clean stones of the cold, clear water which has swept over them and washed their mud stains away.

It is to the study of nature's phases, and the education of the eye that photographers need to apply themselves, rather than to going over the same ground as others in repeated experiments with different printing processes or different developers. As a means of pictorial representation photography will rise to much higher levels than it has yet done. It is also certain to spread to a far greater extent.

It has been found that the alkaline metals are the most transparent to the Roentgen rays; and, according to Professor Marangoni, lithium is the most transparent of these. Sodium is more transparent than potassium, a fact which may indicate that transparency is proportional in some way to the weight of the atom and the density of the metal.

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COMBINING LANDSCAPES WITH CLOUD EFFECTS. BY I. H. FICKEL.

It often happens that one desires a cloud effect in a view which it is impossible to obtain at the time the negative is made. I have visited the Yosemite Valley twice, and there was one particular view which I wished to obtain during one of the many thunder storms that occur almost daily in the Sierra Nevada range of mountains in which the valley is situated. The only view which I could get was one with a clear sky. So the idea of combining that view with a



STORM ON THE SIERRA NEVADA MOUNTAINS

photograph of a storm cloud was tried. The photographs to be copied were of different size, but both had to be reduced.

The photograph of the Sierra Nevada Mountains was placed in front of the camera and focused as for ordinary copying, leaving the proper space for the sky. Before the exposure was made a slip of paper was pasted on the ground glass at the horizon, to mark the position for the second view. A piece of unsized black paper, such as some brands of plates are wrapped with, was held close to the photograph and over the sky portion near the point where the sky and mountains meet, and kept moving slowly up and down over a space of about three fourths of an inch while the exposure was going on. The slide was then inserted, and the cloud photograph was placed in position so that the horizons would occupy about the same place which had already been marked on the ground glass by the slip of paper. When all was ready for the exposure, the same black paper was held over the part of the plate which had been exposed, and kept moving as in the previous exposure. The same length of time was given in both cases so that the finished negative might have about the same density. For the representation of the lightning stroke a line was traced on the negative with pen and ink.

PHOTOGRAPH MOUNTING APPLIANCES. BY E. J. PRINDLE.

Since the creation of the art of photography the most skilful attention has been directed to devising apparatus which would relieve many of the operations of needless labor or enable them to be performed more perfectly, but it is only of recent date that the fatiguing and somewhat difficult task of mounting photographs has been accomplished in any easier way than with the ancient hand roller and blotter.

The first step was in the devising of a combination paster and roller. This implement is the subject of Fig. 1. The frame is provided

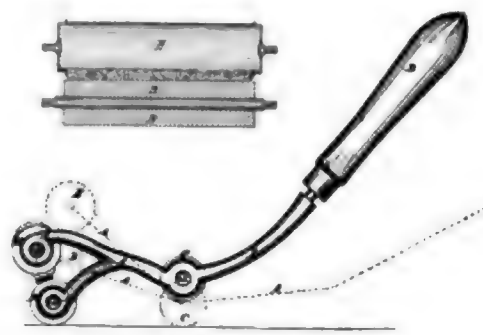


FIG. 1.

at one end with a handle and supports the usual rubber mounting-roller between its branching arms near the handle. These arms extend forward from the mounting roll and are each again branched to afford bearings for the paste receptacle above and a rubber pasting roller below. The paste receptacle has a

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sliding cover on top and is provided with an opening below which is filled with sponge that rests on the pasting roller. The device is first run over the print in the full-line position, and the paste soaks through the sponge until it reaches the pasting roller by which it is applied to the print. The photograph is now placed upon the mount and covered with a blotter. The handle of the mounting tool is lowered; and this brings the mounting roller to bear on the blotter, thus expelling the air and smoothing the print on the card.

A frame that not only mounts the picture, but prints the name of the photographer on the card is shown in Fig. 2. A base piece is

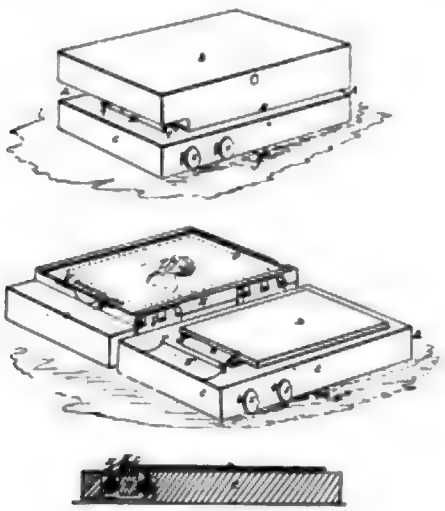


FIG. 2.

secured to the table by screws passing through ears at the sides and has fitted to its upper surface a plate of glass. In a pocket at the front end of the block is a pair of rollers on which is wound an inked ribbon. This ribbon passes over a row of type that is supported on a cross-piece in the pocket. A hinged lid serves to cover the type except when in use. Another block is hinged to the side of the base block, and it has a raised seat for the mount. The mount is held on the seat by a flange that extends over three of its edges. In the operation of the device, the pasted print is accurately placed face down, on the glass plate, and the mount is slipped into place under the flange. The lid is then turned back away from the type, and the corner block is folded over on the base piece, and considerable pressure is applied to it. This brings the mount down upon the print, and, at the same time, the type force the ink rubber against card and make their impression.

A much more practical and efficient mounting frame is illustrated in Fig. 3. As before

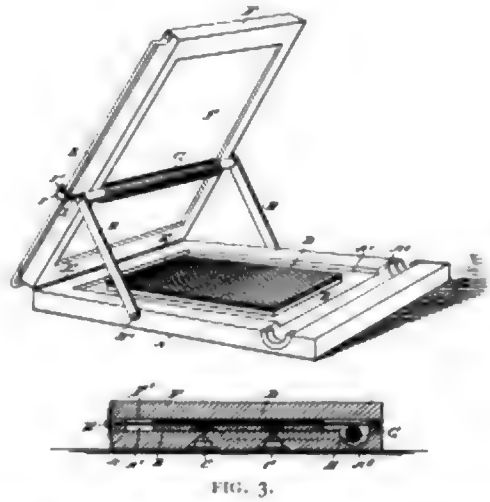


FIG. 3.

this frame consists of a base and a cover block hinged together. A removable board having a rubber facing is screwed to the face of the base, the screws passing through from the back of the base. There is one of these rubber faced boards for each size of print. The cover is counter-sunk in its lower face to receive the mount. A mounting roller is carried by two arms that are pivoted to the base, and it is connected by a coiled spring to a yoke having a roller that runs on a rod which is secured to the side of the cover block. A semi-circular recess in the base receives the roller when the cover block is down. The print is pasted and placed face down on the rubber facing, and the mount is fitted into the counter-sunk recess behind the roller. When the cover is forced down, the roller travels to the outer end of the cover and the mount receives the print. As the cover rises the roller passes over the print, and, under the action of the coiled spring, it thoroughly lays the print.

Instead of a rolling pressure, a direct pressure on all the print at once is obtained in the mounting press illustrated in fig. 4. A curved standard rises from a bed plate, and a hole through the standard forms a guide for the stem of a platen by which the print is pressed. A flat spring is screwed to the upper end of the stem, and, by bearing on the standard, it tends to raise the stem and with it, the platen. A cam, having an operating handle integral with it, is pivoted to the standard and serves to force the platen down with great force. A shoulder on the cam engages with a shoulder on the standard to arrest the cam and handle in verti-

cal position. A number of sheets of blotter is held against the face of the platen by a piece of cloth that is drawn over the face and over a flange on the upper side of the platen where it is held by spring clips that embrace both the cloth and the flange. Guiding ribs are formed

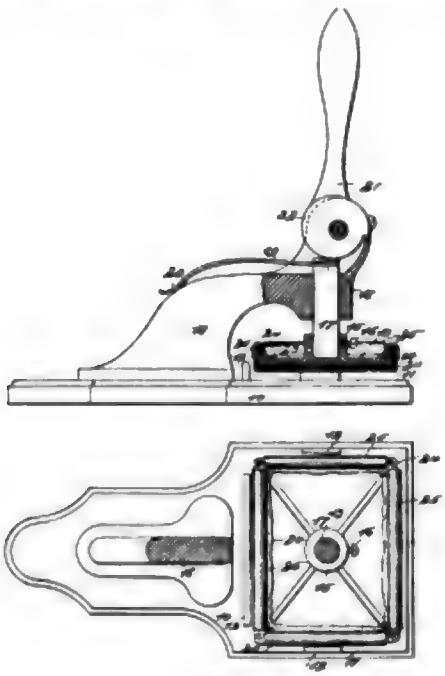


FIG. 4.

on the bed plate to assist in properly placing the mount.

To avoid the necessity of using a blotter with the ordinary hand-roller and of frequently changing the blotter, a hand-roller has been devised, shown in fig. 5, in which a strip of muslin serves as the absorbent material. A yoke of

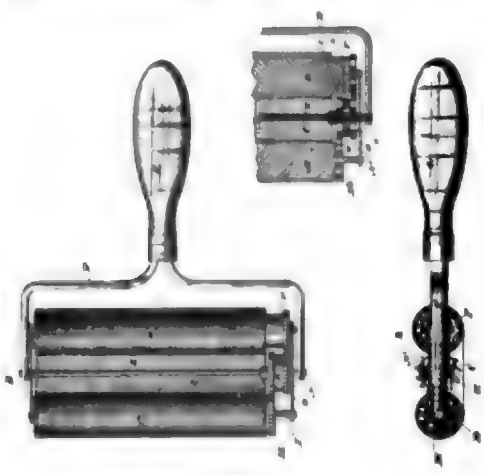


FIG. 5.

heavy wire is secured in a wooden handle and forms the bearings for a rod on which turn two flat metal strips having rods journaled in their outer ends. On these latter rods are mounted two rubber rollers, and the strip of muslin has its ends secured to these rollers and is wound upon them. The muslin passes from one roller to the other on the lower side, so that it lies upon the print and can take up the moisture. A gear wheel is secured to the end of each roller and meshes with one of the two gears on the central rod. These gears on the central rod are connected by a coiled spring so that, while they travel nearly together, the spring can yield to allow for the constantly changing speeds of the rollers due to the change in diameters as the strip of muslin winds and unwinds. As the muslin becomes wet it is wound by hand to expose a fresh portion.

In fig. 6 is illustrated a mounting machine in which an absorbent apron is used. A bed-plate has secured to it, at the ends of its sides, a pair of forwardly curved brackets which are connected by a cross brace. Two swinging bearings are pivoted to the ends of the brackets, and support

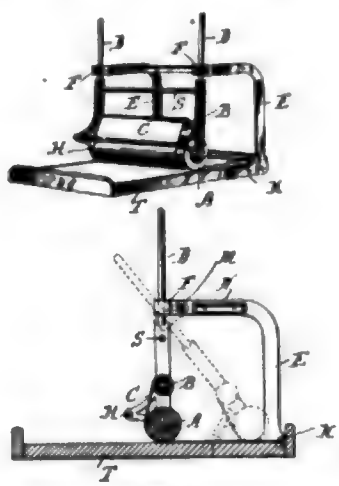


FIG. 6

the stems of the end plates of a frame that carries a rubber roller. The apron is secured to

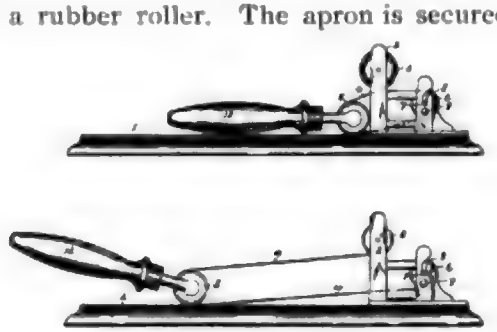


FIG. 7.

the bed plate at one end and has its other end wound around a spring roller that is also carried

by the frame. In use the mount having on it the freshly pasted print, is laid on the bed plate and the frame is drawn back and forth pressing the apron upon the print.

The machine which is illustrated in Fig. 7 is like that shown in Fig. 6 in principle; but it has the further advantage that provision is made for exposing a new portion of the apron in place of that which has become saturated. The bed-plate carries two taller standards, in which is journaled a spring roller; and it has also two shorter standards, having vertically opening slots in which are seated the journals of a second roller. The apron is first wound upon the spring roller and, after passing around the roller of a hand mounting roller, is attached to the second roller. This latter roller has a circle of holes in its end which are engaged by a pin in the standard to hold the roller in a desired position. When the apron has become wet, the lower roller is turned by hand to wind up the wet portion and is then secured again by the pin. The apron not only absorbs the surplus moisture, but it reduces to the minimum the danger of slipping the print on the mount due to a false movement of the hand roller.

A machine that is adapted for very rapid work, somewhat on the plan of the common burnisher, is illustrated in Fig. 8. A large

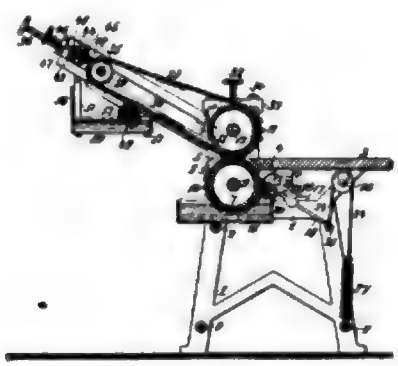


FIG. 8.

framework supports a table and has a pair of vertical guides in which are placed the journal boxes of a pair of rubber-covered rollers. Hand screws at the top of the guides force the rollers together. The lower roller dips into a pan of water, and is engaged on its upward-traveling side by a rubber scraper that is held in a frame carried by a pair of pivoted arms. Cords are attached to the lower ends of the arms and pass over pulleys, their ends being secured to coiled springs on the frame, thus serving to hold the scraper tightly against the roller. The two rollers are geared together at one end. A pair of inclined guide-ways is attached to the vertical guides, and is occupied by the journal boxes of a third roller, the journal boxes being adjusted by hand screws passing through the ends of the guide-ways. A rubber apron passes around the upper one of the pair of rollers and the third roller, and is tightened by the hand screws that are attached to the journal boxes of the third roller. These hand screws

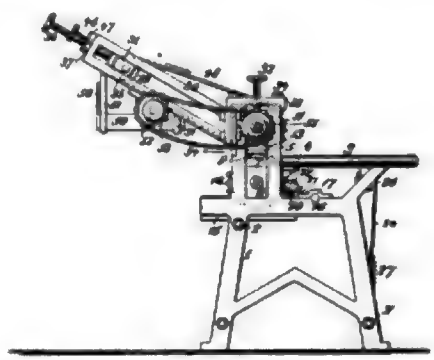


FIG. 9.

also carry a frame that supports, by means of hand screws, a scraper for the apron Suspended from the inclined guides is a pan of water, and a roller in the pan dips into the water and runs against the apron, thus continually wetting it and making it easier for the scraper to remove paste from the apron. In use, the prints are pasted and laid on the mounts and are placed upon the table. The rollers are then turned, and the mount is slid forward until it is caught between the rollers, when the print will be firmly pressed upon the mount. Any paste that is expressed will reach either the lower roller or the apron, and the scrapers will remove the paste from these parts before they reach the print again.

It is certainly not impossible that the future may produce a mounting machine that will automatically paste the prints, accurately place them upon the mounts, and then press them; and the larger galleries would find such a machine a great convenience.

Technical Knowledge: Its Value to Critics.—Harry Quilter, in his well-known work on "Art," makes the following remark which every photographer will do well to ponder: "I have given some years of my life to the study of pictures and to the technical processes of art, for experience has convinced me that without practical power of drawing and painting no real knowledge of pictures is possible."

DRAWING PAPERS FOR CARBON WORK. BY S. HERBERT FRY.

One of the greatest charms of the Carbon process is the adaptability of the method to many or indeed almost any kind of paper vehicle.

In this country, England to wit, many kinds of drawing papers can be obtained from photographic dealers ready prepared for the single transfer process. The man with an idea nearly always requires something different from the commercial article, and a simple means of preparing any paper which is strong enough to stand the process of development which a carbon print has to undergo may be of service to the readers of this annual.

Probably most carbon workers know that all that is required in a single transfer paper is one in which the suction is efficiently overcome by an insoluble gelatine. Any method of coating the paper with gelatine will therefore be suitable, the only point requiring consideration is the best or the easiest way of applying the colloid.

Notwithstanding the text books, I prefer to apply the gelatine to the paper in its soluble condition. That is to say I coat the paper *on both sides* with a ten-grain gelatine solution. This is allowed to dry and afterwards made insoluble in a solution of potash alum, or if preferred of formalin (or formic aldehyde.)

The actual method of applying the gelatine is not very important, but my own method is as follows: Place the paper upon a smooth surface, a pane of glass, or the bottom of a papier maché tray, and rub it over with the gelatine which may have been allowed to "set" or solidify. I rub it in with a solid rubber squeegee, in several directions, and both back and front of the paper. In this way the liability to air bells and ungelatinized places in the paper is greatly minimized, and it is quite easy to be sure that the work is properly done. After the paper has been dried it must be alummed so that the sizing is quite insoluble, and any free alum should be removed by a very short wash or soaking in clean cold water.

This method is so simple that it hardly appears to be with the paper it is printed upon, but as a general rule in photography the simple way is the sure way. Paper prepared as I have directed will be found quite free from blisters, and other troubles in development, and, of course, is none the worse for keeping.

PHOTOGRAPHING UNDER DIFFICULTIES BY REV. DWIGHT W. SMITH.

It was during a ten days' voyage on the Atlantic, from Old Point Comfort to Bermuda, *en route* to Gibraltar, during a succession of those terrible winter blows of January, 1897. Our schooner-rigged yacht, with its eighty-two foot boom and mainsail wrecked and useless; the main jib gone and hatchway stove in. Everything below was in confusion, what was not wet was damp, camera and plates sharing alike in the damage; it seemed a hopeless state of affairs to obtain photographic studies of storm and waves under these circumstances. The opportunities, however, were too numerous and valuable to be neglected. Plates that had been exposed under fairer skies were carefully packed away, and now and then we venture out on the slippery slanting deck of a pitching, rolling, crippled ship, and did our best. Will the negatives be worth the trouble? Will there be any negatives? Ten days and no chance to develop them; twenty days after, in the quiet of a comfortable dark room, anxiously the work of development is commenced, cautiously, methodically, and as scientifically as may be, and one by one appeared, remained, secured, and lo! ninety-five per cent. are valuable for lantern slides, and seventy per cent. will do for silver prints. The similarity of results under such dissimilar circumstances was gratifiying beyond all expectations. How was it done? Before answering this question permit me digress a little. It is an illustration as a sample of a score of others that have come under my observation. It is a collection of negatives that has been made on a costly trip. What a beautiful result this one is, but there are others and others; how painfully evident are the failures to produce anything like uniform results, and yet the circumstances under which they were taken were very favorable. Where is the failure? Something in the development took place, and—and—so on to the end of the list. In another instance some one else did the developing, they were almost as bad. Certainly photographing under such circumstances must be discouraging, but is it necessary? It would seem that if a view was worth the trouble and pleasure of taking, it is beyond question worth a little knowledge and care in its development. It is more than one can readily understand how so many amateurs commit the

unpardonable sin of hap-hazard development. With this digression let me enter a plea in behalf of good photographs under difficulties, by a thought or two relative to saving a picture after exposure of the plate. First, keep a memorandum of your exposures where circumstances vary to any great degree from the normal. Ordinarily the average plate will stand a greater latitude of exposure than is generally supposed, but a wide variation is no pledge of certainty in after results. Second, do your own developing. You can do it, and do it understandingly. It is a work of interest and beauty, almost akin to the exposure of a plate in the full spirit of the occasion, and yet so many miss this aftermath of photography that it is well worth their while to attempt a personal photographic reform. If instruction is needed, it will cost but little, and can be readily procured almost anywhere. Third, it is well to bear in mind that what is called a "single developer," or "one solution" developer, will do the work for those who are not particular as to results, and especially where the same subject can be taken again and again, but never otherwise. The reason and philosophy of development shows how this is true from the fact that a developer is composed of chemicals, two of which are most important factors, and once well in mind, will ensure great success. Of these two factors one is that of sulphite of soda mixture; this alone with an overtimed plate often is sufficient. It is to produce contrast in a negative. The other agent is an alkali, either a potassium carbonate or sal soda solution, or a bicarbonate perhaps. Whichever is used, its work is to supplement the sulphite of soda, and produce details in the negative. With a normal exposure these two solutions are mixed with the developing agent, be it pyro, amidol, metol, etc., as the formula may call for, and forms the single solution or normal developer. Persons often fail to get intensity enough in their plates by the judicious use of these solutions. This fault may easily be remedied by the use of hydrochinon, either used singly, with sulphite of soda or mixed with the old developer. With these agencies one need not despair of good work in these days of cheap chemicals and good solutes.

In my own experience as first referred to, I relied entirely upon metol and hydrochinon used as above indicated. Other developers might have done as well. I have tried them all, and for out of door work greatly prefer this one. It certainly reduces the time from my old reliable friend, Mr. Pyro, quite one-third or perhaps one-half, and gives clear, beautiful, well-printing negatives.

Fourth. In regard to plates, any quick good plate serves for snap shots; or if one uses films, then the results are more uniform than a variety of plates; but here is a fact too often overlooked, that of two given brands of plates of equal speed, as may be, one will be found to work to contrasts, while the other make will work to details. Know your plates or films and develop accordingly. In order to best succeed with views having deep shadows and great contrasts, and those of the reverse, both may be equally successful negatives, with the same time and hour of day, providing the plate working to details be used on the shadow view, and the other plate on the view with but few intense shadows and tending to flatness. I find it a great advantage to take part of my outfit, furnished with these two plates, and the result has been, together with the above plan of development, all that I reasonably can expect. The following formula of metol developer possesses qualities of simplicity that have served me better than any other I have tried to remember or use:

A

Water	1 ounce
Metol	5 grains
Sulphite of soda (crys.)	48 grains

Mix in the order given.

B

Water	1 ounce
Carbonate soda (crys.)	100 grains

C

Bromide potassium	48 grains
Water	1 ounce

To use for normal exposures, take of A, 1 ounce; of B, 2 drachms; of C, 30 to 40 drops, less if too great contrast; move up to 60 drops if more contrast is needed. For intensity, if needed, use the hydrochinon mixture as directed.

Developer Stains.—Pyro stains do not improve the appearance of the hands, and it is better to avoid them from the commencement rather than to attempt their removal when they have once taken possession. If an ordinary jam jar is kept three parts full of a 10 per cent. solution of citric acid, and the fingers are dipped in this immediately after they have been in the developer, and then wiped on the duster, there will be no traces in the morning. If, however, the stains have made their appearance, either a stronger solution of citric acid or hydrochloric acid must be used. Sometimes they will disappear by rubbing with a portion of lemon.

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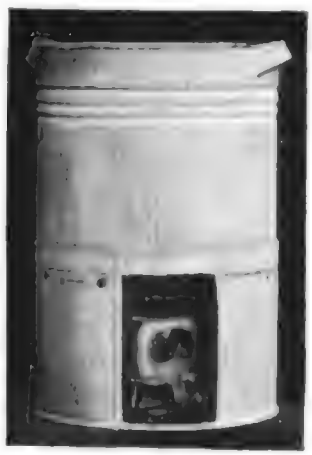
"TAKING THE PICTURE." PEN DRAWING BY HARPER PENNINGTON.

From "The Art Amateur."

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WARM WATER. BY J. R. SWAIN.

PHOTOGRAPHERS during the winter months are very often in need of warm water for toning and to regulate the temperature of the



developer, etc. The illustration shows a very convenient tank for that purpose. It is made of galvanized iron and holds about ten gallons, but can be made any desired size. The coal-oil stove is amply sufficient for all practical purposes.

CONCERNING LENSES. BY DR. JOHN NICOL.

TO-DAY, more than at any period during the history of photography, the people generally are beginning to recognize the difference between that which is a photograph and nothing more, and that which is also a picture, and amateur photographers particularly are striving to produce the latter rather than be content with the former. But, however good may be their composition and perfect their lighting, they will not succeed till they have revolutionized their ideas regarding lenses; till they have ceased to be guided by the optician rather than the artist in their selection of that important instrument.

The optician and the artist regard the lens from two very different points of view. The former sees perfection in flatness of field, freedom from various aberrations, and extent of covering power in proportion to aperture and length of focus; while the latter seeks only that that will best help him to carry out his ideas of pictorial effect. The optician has already done marvellous things, and, from his point of view, got as near to perfection as he probably ever can. He has produced a lens, that will, with an aperture, of *f*/5 or even larger give practically perfect definition all over a plate the base line of which is as long, and in many cases considerably longer than its focal length.

Now this perfection is far from an unmixed blessing. For some reason known only to the opticians themselves, they have got into the habit of charging for photographic lenses according to their focal length; a lens of ten inches, apparently in all other respects the same as one of five inches costing three times as much; and as most modern lenses will cover plates equal at least to their length of focus, their makers have got into the habit of speaking of such, and led others into buying and employing them as 5x4, 8½x6½, 10x8, and so on, with results absolutely inimical to true pictorial effect; results in which true perspective is apparently violated, foregrounds ludicrously exaggerated, and mountains made into molehills.

The remedy for this almost universal evil is the employment of lenses of longer focus. Dallmeyer, at the recent British Convention, said that the lens should be at least as long as the diagonal of the plate, say 8½ inches for a 7x5, and Sutcliff, one of England's most truly artistic photographers, says that except perhaps for standing full length figures, it should never be shorter than twice the length of the plate, seventeen inches for 8½x6½, and the latter is much nearer the mark than the former. The beauty of pictorial photography is simplicity, its bane is the inclusion of too much. An angle of about 35 degs. say, a lens of ten inches for a 7 x 5 plate may be suitable for some subjects, but for all-round, true pictorial work one of 28 degs., a lens just twice the length of the longest way of the plate, will be found vastly better.

"Sunlight and Shadow," we are informed by the publishers, has already exceeded one thousand copies in its sale, it will therefore go into a second edition before the beginning of the New Year.

"The Greatest Annual on Earth," as "The American Annual of Photography" is called in the trade, is ready this month. Advance orders exceed ten thousand copies. Have you placed an order for your copy yet?

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HINTS ON MAKING BACKGROUNDS. BY H. M. GASSMAN.

An amateur will soon feel the need of a background when he reaches the "portrait stage" in photography. It is an absolute necessity for all indoor portraiture because it rarely ever happens that a room can be found where both the light and the color of the wall are suitable for taking portraits. In out door work very few subjects will allow the green background found in nature.

It is true that the background is generally out of focus and plays a minor part when compared with the subject before it, but, if we depreciate the value of the background too much the picture will loose in artistic value When there is a lack of a suitable background to a picture the average observer feels that something is lacking, yet he cannot locate it. The extent to which the amateur can remedy this will depend upon his artistic ability to produce a background.

It is assumed for various reasons that the amateur would not be able nor justified to buy the number of ready-made backgrounds necessary for producing various effects. The purpose of this article is to encourage the amateur to make his own backgrounds. He will undoubtedly meet with some failures, but we hope, at least, that these few points will be the means of lighting up the dark road of "cut and try."

It is preferable to make the frames uniform in size, and of as light material as possible. A convenient size for heads and busts is six feet square, while for groups, etc., eight by ten feet will be large enough for ordinary work. For the larger size use wood two inch by two inch, and for the smaller one and one-half inch by one inch, the narrower face to be the edge of the frame. A convenient support for the frames can be made by taking for uprights two pieces of wood four feet long and somewhat heavier than the frames, fastening heavy pieces fourteen inches long across one end of each piece for feet. Connect these feet by pieces long enough to give a width between the uprights equal to the width of the background. Bore holes in the uprights at intervals of three inches, and also one in the middle of each side of the frames. Two wire nails or screws are used as horizontal axes for supporting the frames. The background can then be used in four different positions since it is square. It can be swung at any angle and can also be raised or lowered in the different holes of the support.



PORTRAIT BY MORENO

It is not necessary to make such a support for the larger frame but fasten directly to the frame two feet and provide them with castors. If it is desired to use it in various positions feet can be put on all four corners. This frame can be made portable for indoor work by sawing either the longer or shorter edges in half, and then heavy pieces screwed over the sawed places when the background is to be set up. In folding the background with canvas side inward a round stick should be placed at the fold to prevent a crease in the canvas.

For covering the frames use common unbleached sheeting or any kind of material of sufficiently fine texture and of the width desired. A tightly stretched surface can be obtained by tacking on the material while it is a little wet.

The background paint is best prepared thus: cover two pounds of whiting with water; allow it to stand ten minutes and then stir until free from lumps, and has a creamy consistency. Swell three ounces of glue in sufficient water, melt,

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and add nearly all to the whiting. To the remainder, add one teaspoonful of lamp black and stir until smooth. Add enough of this latter to the whiting to give a pearly gray color *when dry*. Avoid getting the paint so thin as to run and make streaks. Stir thoroughly and apply evenly with a broad paint brush or whitewash brush. The paint always dries much lighter in color. The proper color can be determined by trial with the eye and then by the camera.

This makes the plain foundation. Variations from this point onward depend upon artistic skill. Cloud effects are numerous, and exterior or interior scenes may be worked on the canvas.

For the portrait backgrounds a plain light, a plain dark, and several cloud effects; for groups, etc., a cloud effect and an interior or exterior scene will be ample for the amateur. Since both sides of the canvas can be painted, or canvas can be put on both sides of the frame, three frames will be sufficient for six backgrounds. Since the frames are uniform any one may be used in the same support.

The cloud effects are made upon the pearl gray foundation by means of lighter or darker paint, or both. The clouds are painted roughly the intended shape and shade. This must be done rapidly so that the dry foundation does not become wet and blend with the color being applied. With some rather thick glue water make a broad band around the edge of the wet clouds. Then at once shade one into the other with a stippling brush or a rag-pounce made by gathering a rag around a ball of cotton or other soft material. The method of use is to beat on the background in the cloud and near the edge of same, then work all around the edge getting nearer the edge after each circuit and gradually shading off into the foundation. Always work the lighter color into the darker. Suggestions in regard to making clouds may be obtained from those clouds found in paintings, photographs, and the sky.

Some Members of The London Stock Exchange have formed a photographic society for the mutual criticism of prints.

AN EXPERIENCE. BY H. C. VOORHEES.

During the past summer, while stopping at the shore a few days, I endeavored to make some marine views, but the only results I could secure were weak, foggy negatives.

The usual expedients were resorted to, such as changing plates, developer, etc., but results were still the same, and I finally concluded that I was there for pleasure, and put away my camera, thoroughly disgusted—with what I hardly know.

A few days later, while in a more generous mood with myself and the world at large, I took out my camera again and set it up on the tripod to look at some friends in bathing, but



A FROSTY MORNING BY PAUL LANGE

the same smoky image was yet there as if the lens was foul

Having taken the lens apart on the previous day and thoroughly cleaned it I was positive the result could not be from that source, but like a drowning man grasps at straws I took out the lens and again cleaned it thoroughly with chamois. Upon replacing it the result was astounding.

On the ground-glass was now an image which for snap and brilliancy I never saw excelled. I made an exposure and secured excellent results.

By carefully cleaning the lens thereafter before each exposure the results were equally good, but in even so short a time as an hour or less there would be a *blue scum* formed on the

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lens, which was evidently the cause of all my trials and tribulations.

In comparing notes with some amateurs, I found this scum, evidently formed by the humidity in the atmosphere, was an alarmingly fruitful source of photographic failure at the sea shore. May we all profit thereby.

PHOTOGRAPHIC REVIEW. BY M. A. GRANGER IN THE "MONITEUR SCIENTIFIQUE."

Translated for The Photographic Times by D. W. Colby.

Patinotype Processes.

A modification of the ordinary method of preparing platinotype papers has been proposed by Baron Hubel. To the solution of oxalate of iron ordinarily used 5 grains of oxalate of lead is added. This has the property of facilitating the action of the light rays. Paper coated with this new solution is developed with potassium orthophosphate.

Blank has given another method for preparing a paper containing both platinum and silver. According to this author heavy Rives paper is floated upon a bath composed of

Iron and ammonium oxalate	20 grams
Water	100 c. c.
Potassium chlorplatinite, 2 per cent. solution	5 c. c.

After drying this paper is exposed and developed with

Water	250	c. c.
Silver nitrate	1	gram
Citric acid	1	gram
Oxalic acid	0.5	gram
Iron and ammonium citrate	2.5	gram
Potassium bichromate 10 p.c. sol.	5	c. c.



THE DIVER BY PAUL LANGE



REFLECTIONS BY PAUL LANGE

The prints are then washed and fixed in the following bath:

Water	200 c. c.
Ammonia	4 grams
Sodium citrate	4 grams

A brown tone can be given to the platinum prints by soaking them in a bath containing uranium salts. This bath is made as follows:

A

Uranium nitrate	1 gram
Water	100 c. c.

B

Potassium ferricyanide	1 gram
Water	100 c. c.

For use 50 c. c. of A and 20 c. c. of B are mixed with 50 c. c. of acetic acid.

M. Kühn by replacing platinum by palladium salts has prepared a paper which with warm development gives brown tones. The tones obtained may be varied by using different proportions of the salts of the two metals. Later Pockham has obtained different tones on platinum paper by allowing them to stand in a bath containing catechu. This bath is prepared by putting 7 grams of catechu into 140 c. c. of warm water and allowing it to stand three or four minutes. This liquid is then decanted and 28 c. c. of

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alcohol added. For use 4 c. c. of this solution is put into a liter water.

PHOTOGRAPHING COLORS.

Vincent Elsden recommends for forming color screens the following solutions:

FOR VIOLET.

Copper sulphate, saturated solution	7 c. c.
Water	17 c. c.
Ammonia	3 c. c.

This is filtered and to it is added:

Methyl violet B in concentrated solution	3 c. c.
Fuschine	5 c. c.

FOR ORANGE.

Cobalt chloride, concentrated solution	15 c. c.
Water	35 c. c.
Ammonium bichromate	25 c. c.
Ammonia	2 c. c.

For green a solution of nickel sulphate is used.

These liquids are introduced into glass cells with parallel sides about one-eighth inch thick.

HELIOGRAPH AND AUTOTYPE PROCESSES.

Classen, of St. Petersburg, has patented a process for preparing sensitive plates of bichromated gelatine. The invention consists in first covering the glass with a coat of some resin before coating with gelatine. This produces a fine grained and very adherent surface, which can receive several preparations if desired. Albert has proposed to replace the much too fragile glass by aluminum plates. Here is the process. The plates of metal are washed with dilute ammonia and dried with linen. The plates already used are levelled in a press and washed in water acidulated with one-thirtieth of its volume of sulphuric acid to free them from the gelatine. It is well, in order to facilitate the adherence of the gelatine to the plate, to rub the surface with beer, to which has been added silicate of soda, free from caustic alkali

Plates which are scratched or dented should be rejected, as they will give defective images.

These plates are rather delicate to use because of the action upon them of alkalis and alkaline salts.

A method of obtaining heliographs of images having the appearance of engravings is given by Moses. The method of procedure is very



PICTURES IN THE FIRE. BY E. LEE FERGUSON

simple and the entire operation so easy that painters, architects, and designers can make use of this new process.

Some of the details given by the author are as follows: One begins by fixing a film of gelatine upon a piece of ground glass by means of a coating of some glue, insoluble in water, and then covering the film with a thin and regular coating of wax, bitumen, and mastic, dissolved in turpentine. It is upon this surface that after the drying is complete the design is worked out with a graver in the usual manner.

When the engraving is ended the plate is brushed over with an aniline color of a dark tint ground with a solution of bichromate of potash. By exposure to light those parts of the gelatine touched by the bichromate become insoluble, and consequently the insoluble parts correspond to the lines of the design. The coating covering the gelatine is now removed with turpentine and the plate flowed with a water solution of glycerine, ammonia, and potassium nitrate. This solution causes the gelatine remaining soluble to swell up, the image being then in depressed lines. The plate can then be printed from by passing over it a roller charged with a fatty ink. Hislop has brought out a process which approaches the Fischlein process with India bitumen. We will give some details of the process.

The bitumen or resin is first finely pulverized in a mortar or in a mill. The latter is to be preferred. The powder which should be very

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fine is sifted before use. The following solution is then prepared:

White gum arabic	60 grams
Water	300 c. c.
Chromic acid	0.7 grams
Potassium bichromate solution	30 c. c.

When these substances are completely dissolved a sufficient amount of the pulverized resin is added to make a thick liquid, but not enough but that it will still flow readily. The delicate point of this process is here, for as the material is too stiff or too liquid exposes one to misfortune. With an excess of the powder it becomes impossible to completely cover all the surface of the plate and not leave small portions of the metal uncovered. A copper plate is covered with a coating of this preparation and dried in a drying oven. After drying at a heat which must not be too great, the plate has a matt surface without brilliancy. The plate is exposed as ordinarily, taking care to observe that the bitumen is a little more slow than the resin, and it is ready for development. This is done in the following manner: Into an earthen pan containing water is put a sufficient amount of white wood sawdust to make a porridge. The plate is placed in this mixture and vigorously rocked. The image should all come out rapidly but remain very weak. The plate is then washed with water, dried with alcohol, and passed lightly through a flame until viewed by oblique light, the coating appears brilliant When this stage is reached, it is put in a biting bath of dilute perchloride of iron. This attacks the plate smoothly and preserves the half tones. It is necessary for the development to give good results that the drying be not carried too far.

Papers for architects, &c.

Arndt & Troost have put on sale at Frankfort under the name of *Sepiablitzlicht Papier*, a paper which exposed under a negative gives good line designs in brown upon a white ground.

The mixture with which the paper is coated has the following composition:

Water	800 c.c.
Iron and ammonium citrate	80-100 grams
Silver nitrate	12-20 grams
Tartaric acid	15-20 grams

To this is added 10–15 grains of gelatine which has been dissolved in 200 c. c. of warm water. This paper keeps well and is five times as sensitive as cyanotype paper. The development is effected with pure water. Valenta uses the green citrate of iron and ammonia in place of the brown salt as usually employed for these papers. According to him this mixture gives satisfactory results.



CROSSING THE STREAM BY PAUL LANGE

A

Iron and ammonium citrate	12.5 grams
Water	50 c.c.

B

Potassium ferricyanide	4.5 grams
Water	40 c.c.

These are mixed as wanted and spread upon the paper. This preparation is eight times as sensitive as where the brown salt is used.

Fisch coats paper with

Gum arabic	25 grams
Water	100 c.c.
Potassium bichromate	7 grams
Alcohol	1 c.c.

After drying the paper is exposed and developed with pure water. The prints after drying are coated with a varnish composed of:

White lac	5 grams
Alcohol	100 c. c.
Black bryony	15 grams

and are then immersed in a bath of 2 per cent. sulphuric acid, in which the portions insolated are dissolved, and the black becomes strongly attached to the paper.

National Photographic Record Association.—This association has been formed for collecting photographic records of objects and scenes of interest throughout the British Isles, with a view of depositing them in the British Museum, where they may be safely stored and be accessible to the public under proper regulations. Full particulars can be obtained from the Honorary Secretary, Mr. Geo. Scamell, 21 Avenue Road, Highgate, London, England.

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ODDITIES IN LANTERN PROJECTION. BY WILLIAM HALLOCK.

THE projection lantern has become so familiar to us in all places and under all circumstances, that it is almost impossible to imagine a novelty in connection with it. Nevertheless there may be one or two things about it that are not well known.

Occasions arise when the lecturer wishes to operate the lantern himself, or perhaps wishes to perform some delicate experiment in the field of the lantern, so that it may be visible to a large audience, and it might be very inconvenient to leave the lecture table and go to the back of the room. Under such circumstances he is usually compelled to be contented with projecting across the room, an operation as unsatisfactory to him as to the audience.

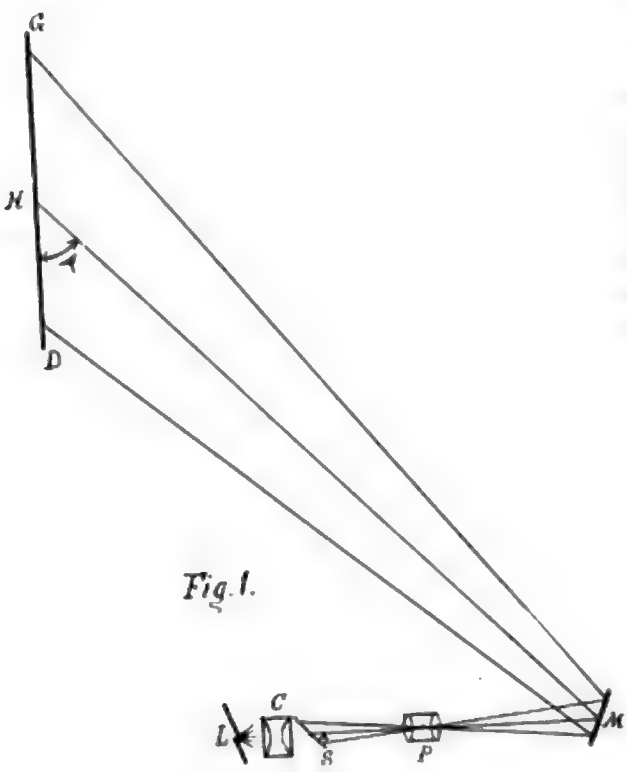


Fig. 1.

By using a mirror as shewn at *M* in Fig. 1 the picture or other image can be thrown upon the wall, or a screen behind, and over the head of the lecturer, and above a blackboard, which is usually there. So far there is nothing new. Owing to the fact that the screen, *GD*, is not perpendicular to the axis of projection, *MH*, a distortion of the picture will result, as well as an impossibility of getting the whole field in focus. If, however, the slide is tilted, as shown at *S*, so that the angle *a*, is about equal to the angle *A*, then the distortion, as well as the inability to focus, will entirely disappear. The best results are obtained when the angle *a* is nearly 90°, and when the projecting lens, *P*, is of rather long focus.

A lantern slide of the full moon is a projection of the surface of a hemisphere upon a flat surface, and is hence much foreshortened around the edges. If such a slide be projected upon the surface of a white sphere, by means of a long-focus lens, the picture will be developed into a hemisphere again, and the foreshortening eliminated. See Fig. 2. Of course,

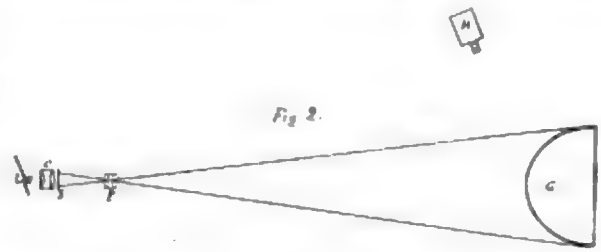


Fig. 2.

any slide of the moon in any phase can be projected in this way, provided matters are so arranged that the projected image has the same diameter as the sphere receiving it.

Suppose that while the image is upon the sphere with the foreshortening eliminated, a camera be set up at a point, *H*, and a picture taken. Evidently we shall have a view of the



FIG. 3.

moon as if taken from a point a hundred thousand miles or more out in space. This very ingenious suggestion is due to Prof. O. N. Rood. Such a photograph was taken and is shown in Fig. 3. The original slide is shown in Fig. 4. Unfortunately the turmoil and hurry of moving

prevented me from experimenting until the results were satisfactory, but they may serve to show the practicability of the method.

Many slides of landscapes, marine views, etc., are foreshortened pictures of flat objects, at an



FIG. 4.

angle to the line of sight of the camera. The naturalness of such views may be enhanced by projecting them upon an oblique screen, as shown in Fig. 5. A long-focus projecting lens



Fig. 5.

should be used, and it should be diaphragmed down until the focus on the whole screen is good. A photograph taken from a point in the direction *HB* will be an approximation to a bird's-eye view of the original landscape.

A careful and complete series of experiments may show that the method has a certain amount of practical value, for example, as an aid to the topographer in his delineation of the surface of the earth. In any case the possessor of a lantern can amuse himself and his friends with several new and very pretty effects, by leaving the old flat screen and adopting one suited to the particular picture which he is projecting. In fact the method will enable an ingenious tinkerer to construct such special screens. A relief map of a tract of land could even be made in this way from a simple photograph. One only needs to make a few experiments along this line to become sufficiently interested to continue.

PHOTOGRAPHY AS APPLIED TO COMMERCIAL PURPOSES. BY CARL NEMETHY.

To produce photography in colors as nature shows them and the eye sees them is the aim of the scientific operator since the ordinary photographing process came into general use. Films showing brilliant lines and tints similar to mother of pearl were produced many years ago—even such negatives are being made now that will produce a color effect true to nature; but the fixing of such color plates is not perfected as yet, and the honor of being the inventor of that undoubtedly great achievement has not been bestowed upon any mortal—but I hope that the laurels soon will crown the brow that will study out the right way of solving this great problem. We can be proud though of the astonishing results that we have obtained in photography as far as black and white work is concerned, in the fact that there is nothing that has been applied to scientific art purposes with so great a boon as photography. With its aid we can see and forever permanate things that even the naked eye cannot see. We can photograph unseen stars and flying fragments of the heavens that the naked eye cannot perceive—we can penetrate not only the air and endless space of the sky but solid bodies, flesh, fiber, metals, etc. We expose the inner of the human body and disclose to the eye that mysterious mechanism of the living, showing not only the bony substance as dark, blurry marks, but we can see the texture of the bone and perfect formation of same. The illustration here shows a hand of abnormal size—it is 6" long from the points *a* to *b*, and the tips of the fingers show the beginning of a disease—the bone turning into crystalized condition, and the transformation is plainly visible on the photograph made with the aid of the X-ray or Roentgen ray.

Photography is as yet a mystery even to the scientist, and the possibilities are not comprehendable. Think of photographing sound, a vibration produced that cannot be seen, only the ear can perceive it. We had no idea of the shape and form of sound until photography made it possible to record the same. Did you ever give a thought to what photography may accomplish in connection with electricity? See what Nicola Tesla has achieved in his electrical inventions — into what prominence he has brought photography, and *vice versa*, has photography brought his and other inventions. What other means could be employed but pho-



FIG. 1.—RADIOGRAPH OF A HAND

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tography to record the many thousand little marks by the new telegraph he is now perfecting? The receiver of this apparatus contains a rapidly revolving photograph film which is exposed to the light waves caused by the alternating current. After developing the film the small marks can be seen plainly on it, and with some experimenting a developing arrangement can be attached to the receiver that at an instant will develop and prepare the photo plate for immediate use. How about the old gelatine process? Is there an end reached in the old photographic swell process, the gelatine process of old? Why should it not be possible to prepare some substance chemically so that when a light is reflected upon it by a photographing apparatus that such portions as are exposed to the reflection of strong light through the lens, it will turn that substance chemically and make it insoluble, and if it is possible to produce a relief plate of great depth from a pen drawing, why not regulate the swelling of the substance according to the shades, half shades and high lights, and thus produce a bas-relief by a photo-mechanical process?

METHOD IN PHOTOGRAPHY.

BY C. M. GILES.

I OFFER, for the advantage of beginners especially, a few hints born of experience, which I hope may prove of practical benefit to some one and thus help in saving annoyance and loss. In all kinds of work, or recreation, it is advisable to have a well arranged plan, or system of action; and always, except in very exceptional cases, to hold to the system. This is more specially true of photography, because, if it is not one of the exact sciences, it is an exacting one, and there are usually many things that require careful attention at one and the same time. When doing hurried work which requires promptness of manipulation this fact often brings the novice to grief, because he is likely to omit one or more important steps in the operation, resulting in a probable loss of time, material, picture, and temper. Here is where a carefully arranged routine comes to our assistance, by bringing into play that characteristic of mind which we call habit. The mind tends toward doing without conscious effort whatever is the established custom, so that it becomes automatic and ceases to help confuse us in times of necessary haste.

The many "conveniences," "improvements," and adjustments of the modern camera furnish just so many pitfalls for the "immature," and it would probably be time well spent for most owners of a new camera to have a more or less extended rehearsal of all the adjustments and movements pertaining to the taking of a picture in a well settled regular order until the routine became fixed, before exposing a plate.

In the matter of filling plate holders, also, the haphazard way of some workers leads to annoyance or loss. By the use of system and care, holders can be filled in absolute darkness without danger of mistake. First be sure before darkening the room to have a clear and clean space to work in and on, and everything as handy as circumstances will permit. Dust the holders, slides, etc., carefully. Stand two slides, black side toward you, and *handle end down*, with holder to which they belong in front, on shelf or convenient place, and so on with a pair of slides and holder alternately, as many as you expect to fill. Darken the room, open the plate box and arrange plates, end toward you. Now, remembering that plates are packed in pairs, film to film, take plate-holder in left hand and lift the first plate in the box (which will be glass side up) by right hand corner next you and turning it from you it brings film toward you ready to place in holder in the space next you. After it is in the holder dust the plate carefully. Then giving the slide a half turn in picking it up, the black side is in proper position to be next the plate when put in. In filling the other side of the holder remember that the next plate lies film up and take it by the right corner furthest from you and it needs no turn but is ready to put in place. The next pair of plates fill the next double holder in the same way and so on. This may seem like a complicated direction for a simple thing; but I am led to believe that each step is important in its proper place. The habit of placing the slides handle or wood end down is very important, as it prevents the edges getting into stray liquids, and thus becoming soaked and ruined, as is too frequently the case. If, in taking plates from a box, an uneven number are left, the fact should be noted on the box, and then it will be known that the first plate will be film up and manipulations governed accordingly.

In the mixing of chemicals also there is

always a logical sequence which ought to be observed, and which can seldom be neglected without injuring the quality of the product. The formula, if properly written, will indicate this, and should be carefully followed.

I venture to assert that a large share of the vexatious double exposures, exposures missed, and other annoying mishaps, are due entirely to a lack of system on the part of the photographer. It does not seem necessary to elaborate the idea farther, as the purpose of the article is to call attention to certain principles which seem important, and which each worker can best particularize and put in practice for himself. The idea which I wish to emphasize is that photography demands, is worthy of, and will repay careful and painstaking system in its various manipulations, and will avenge itself for any neglect.

THE FUNNY MAN ON SERIOUS PHOTOGRAPHY.

That John Bull has not become too "intense" for humor, even when confronted by the very much in earnest display of the Linked Ring Exhibition at the Dudley Gallery (London) is evidenced by the subjoined extract from *Croydon Society Gossip*:

The fifth exhibition of Æsthetic Photography was opened on Saturday. Personally we are not "in the know" respecting the aims and objects of these camera conjurors, but an up-to-date friend kindly trotted us round the gallery and explained things as follows:

"This is an example of what we may call pepperpot photography. The object in view is to show what pretty pictures can be got with the most unsuitable means. Here, again, observe the grand effect produced by a judicious crossing of the methods of the old blue china plaques and crayons on rough paper."

"Yes, yes," we exclaimed, "but what a ripping thing that is over there," and we pointed to a big, silvery-looking article which might have served for the decoration of a high art iron safe. On consideration, however, we concluded that the butterflies and daisies with which it was embellished made it better suited for a tea canister. We afterwards found out that it was meant for a frame.

"See here," said our guide, "the photographic poster has arrived!"

Sure enough there she was—the hideous daughter of Beardsley, clad in a neat costume cut out of sticking plaster. From this we turned wearily away.

"Hullo! that's neat—that woman there, without a head, who is looking at a negative. Seems appropriate, too—so symbolical, don't you know, of how most of them examine their works."

The guide sorrowfully checked this rash irreverence and painfully pointed out that there *was* a head, but that it had somehow got entangled in the tall young person's "balooners."

"In the next," droned out our guide, with verger-like intonation, "behold the induction of Queen Camera to the Seats of the Mighty. The design is called "Photography Receiving the Approbation of Science and Art."

Although the title suggested "Biggs receiving the encouragement of Drivelli and Toothick," we could not linger long before the above.

"This, now, is more in our style," we informed our guide, 'A Study in Blood,' by M. Bremard. Not only do we admire the blood but also the flesh, which last is superb! Pity the lady's name is not given."

"What are you staring at? come along, do," said our guide, rather pettishly. "See here, we have color photographs."

"So, at last!" we murmured. "And it is just as we expected. Nature and the camera can never color as the human eye can see; the glories; the rainbow hues; the opalescent glints; the——"

"Hold on," said the guide. "Although these are colored by photography, the colors themselves are selected by the photographer."

"Well, if this is Art, give me Nature. After all, if she be not so good a colorist as Imagination's airy fancy would paint a scene, she cannot turn out stuff like this." And we pointed disdainfully—for we felt disgusted—at certain eyesores in green, blue, and brown.

"Where," we queried, "are the rest of the technical exhibits?"

"Hush," admonishingly whispered the guide, "for goodness sake don't talk of technique here, or you'll get the chuck. All that they recognize in this place is Art!"

"If that is so, give us what you call 'the other thing.' When we, the personification of Croydon culture—when *we* come to look at photographs, we don't want to be put off with halting imitations of chalk drawings, nor with far-away copies of the old masters, nor with those abominably crude color smudges. What we want to see are choice examples of the incomparable qualities of which a good photograph possesses the monopoly."



OPEN-AIR STUDY BY PAUL BERGON

THE SWING BACK IN COPYING.

When we last wrote on the swing back we dealt with the methods of correcting the various forms of distortion that result in photographs taken with a tilted camera, and, though we showed that it is quite possible to restore such distorted pictures to absolute accuracy, we left the matter in a somewhat indefinite condition, as we had not then formulated any practical plan for arriving at the proper position the original and the copy should occupy in order to attain the desired result. We make no apology for returning to the subject, as, since our last article, we have reduced matters to so simple a form that there is not the least difficulty in dealing with any existing photograph, although there may be no more data available than the distortion present; and it is possible in the future that, when architectural photographs are taken chiefly for reproduction on a different scale, as for lantern slides or enlargements, not only will the photographer be independent of the swing back, but he will produce absolutely better results without its aid.

The letter of Mr. W. H. Wheeler a fortnight ago is interesting as indicating the cause of the apparent anomaly between the effects of swinging the back of the camera when taking the negative, and inclining the sensitive paper or surface when copying from it. We were under the impression, as we intended, that we had pointed this out, or, at least, that the difference in the result produced when copying to the same scale was that, in using the swing back, that alone acted, while, in copying, the intervention of the lens had to be considered as well as the amount of swing or inclination. The method of correction recommended by Mr. Wheeler is as simple as could be, but, we are afraid, of very little use in the majority of cases in actual practice, even though an unlimited "battery" of lenses were available. As a rule, if not invariably, architectural photographs are produced by means of more or less "wide-angle" lenses, and, if for a 10 x 8 plate the by no means unusually short focus of six inches be used, it would be obviously impossible to reproduce the negative the same size *with a three-inch focus lens.*

We referred in our last article to a formula we gave two years ago for ascertaining the cor-

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rect angles of inclination for original and copy in correcting convergence, but this formula was calculated purely with a view of securing perfect sharpness without reference at all to the distortion produced by the inclination. It occurred to us to try this formula upon the distorted chessboard diagram already referred to, as we feel sure the result could not be far from accuracy, as, both original and copy being inclined, it must in any case be better than if either alone had all the inclination. But, on applying it, we were surprised to find that it worked out with absolute accuracy in every respect, not only with regard to convergence of lines, but also correctness of proportions. Here, then, is the solution of the difficulty, and, though, as we shall show, no calculation is absolutely necessary in practice, we may briefly show the principle on which the matter rests, and then leave it for our readers to judge whether an operation that has been considered one of great difficulty and complexity is not in reality nearly as easy and simple as ordinary copying.

Let us just recapitulate the details of the formula. The first step is to measure the amount of enlargement required by the top of a building in order to bring it to the same dimensions as the base and to render the sides parallel. It is of no use measuring the angle at which the sides are inclined, as this angle varies at every point except the center of the plate; but *at any part of the plate measured from the center the difference between the top and base will be proportional.* Thus, if two sloping lines, one at the extreme margin of the plate and the other midway between it and the center, be measured at the top and bottom, the *difference* between the top and bottom measurements will be proportionately the same in both cases, although the marginal line has twice the slope of the other. In other words, if, on a twelve-inch plate, two lines respectively two and a half and five inches distant from the top center be chosen, if the former were found to measure at the base two and five-eighths, the latter would be five and a quarter—in both cases one-twentieth larger.

This, then, is the basis of measurement, and, though it may not be possible to find a converging line reaching from top to bottom of a negative, it is easy, by means of a straight edge, to continue one for purposes of measurement to any convenient length from six or eight inches Having found the proportionate difference—in the above instance one-twentieth—we have to enlarge the top of the picture, or, what amounts to the same thing, reduce the bottom—one-twentieth, in order to restore the perpendicular. For this purpose we calculate, by the rules of conjugate foci, the distance at which, with a lens of given focus, the top portion of the picture must be approached to the lens, and the same portion of the copy removed from it in order to give that degree of enlargement. The bottom portions of each having to remain the same size will each be distant from the lens twice its focus.

However, let us carry out the experiment on the chessboard diagram. On measurement we find the top and bottom stand to one another in the proportion of 23 : 25 as nearly as can be measured, and the height of the diagram is $3\frac{1}{8}$ inches. We have to enlarge the upper portion, therefore, to $1_{\frac{2}{3}}^{2}$, or $\frac{25}{23}$ its present size. Calculating by the rule on which our tables of enlargements are framed, and for an $8\frac{1}{2}$-inch-focus lens, we find that the longer conjugate focus should be $17\frac{1}{4}$ inches, and the shorter $16_{\frac{2}{3}}^{2}$. Taking a large sheet of paper, we rule a horizontal line to represent the axis of the lens, and mark it with a center point to indicate the lens itself or its optical center. Now, to the left and right, set off the different conjugate focal lengths; to the left 17 inches, and $16_{\frac{2}{3}}^{2}$ and to the right 17 inches and $17\frac{1}{4}$, and draw perpendicular lines through the points crossing the axis of the lens.

Next, with the dividers, mark off on a strip of paper the exact length of the diagram $3\frac{1}{8}$ with a point to indicate the exact center, and, with this point on the axis of the lens, lay the strip of paper so that the terminal points fall respectively on the two uprights representing the focal distances. Draw a line joining the two points, and this will represent the position to be occupied by the diagram to be copied. The other position can be arrived at in the same manner *if we know the length the reproduction ought to be*, which in the ordinary course of events we do not; but it is still more easily arrived at by drawing lines, from the extremities of the sloping one just found, through the center of the lens, until they cut the focal distances on the other side, and by joining the points of intersection we get the position of the sensitive surface. If the compasses be applied to this last line it will be found to measure exactly four inches.

On measuring the angles, they are found to

be *exactly the same*, for, though the two focal distances on the right are a trifle further apart than those on the left, the increased distance between the intersecting points makes the angles equal, and in this case we find it to be 11 deg. The diagram was made with the camera tilted, as we believe, at an angle of 12½ deg, but it strikes us as possible that we may have measured carelessly, and that the proper angle of inclination for correction is equal to that of the tilt applied to both original and copy. We are the more inclined to believe this because, as Mr. Wheeler points out, a lens of half the focal length when copying the same size corrects the distortion produced by the tilt, and the angle has a direct relation to the focal length, as may be shown by repeating the diagram for lenses of different focus.



WHERE BREEZES BLOW BY ALLEN E. BAILEY

There is one other point that a study of these diagrams will make clear, namely, that the angles of inclination are precisely the same for any degree of enlargement or reduction by the same lens from the same negative. Alteration of the focus of the lens varies the angle—the shorter the focus the less the inclination—and alteration in the tilt of the camera necessarily does so, but otherwise there is no more trouble involved in the process of correction than in ordinary copying.

It may be said that all this calculation and diagram-making means trouble, but it is not necessary except to explain the principle. The calculation will certainly give the position of the original, from which the proper position of the sensitive surface is got without trouble in focusing, all that is required being to get the focus and the uprights parallel; or, without calculation at all, the original may be inclined until the lines are fairly perpendicular, and then part of the inclination given to the focusing glass, the two being gradually altered until the proper position is obtained. If a note be made at the time of exposure of the degree of tilt, there will not be much wrong with the final result if the same inclination be given to both negative and copy, the same lens being used, or proportionately more or less if a longer or shorter focus be employed.

For taking the angle of the camera, a very simple appliance consists of a short metal "plumb," like that known as the Thornton-Pickard, supplemented by a small protractor let into the body of the camera. This is a very easy and simple addition, while, for those who wish to go in systematically for "boycotting" the swing back (out of doors, at any rate), it would not be difficult to devise a copying arrangement, in which the copy board and focusing glass are connected, so as to swing sym-

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metrically and in unison. Then no calculation or bother would be involved at all, but simply, after getting the focus, a movement of the focusing glass, by which also the negative would be adjusted until the lines were parallel and *voila tout!*

We have a strong feeling that the future of architectural photography, especially interiors, lies in the direction of small plates, modern lenses of wide aperture with critical sharpness, *used at their best*, that is, by tilting the camera instead of calling into use the swing back. In this manner, not only is rapidity of exposure promoted, but the finest possible definition secured with perfect freedom from distortion.—*British Journal of Photography.*

THE RESTORATION OF FADED PRINTS. BY W. B. BOLTON.

In the issue for August 26th last, at page 540, under "Continental Notes," mention is made of a process published by Herr Kopecky, in the *Photographische Correspondenz*, for restoring "yellowed" albumen prints, the said method consisting in converting the image into silver chloride, and afterwards redeveloping or reducing it by means of hydroquinone. Some five or six years back I published practically the same process, giving, however, several alternative methods of bleaching, and although the method is a thoroughly practical one when properly worked, certain conditions must be observed in order to ensure success, and I am afraid the meagre details given of Herr Kopecky's plan will scarcely suffice to that end.

In the first place there is something obviously wrong with the bleaching formula quoted, since if the proportion of water were ten times as great as that given it would still constitute a practically saturated solution of potassium bichromate, the effect of which would be to increase rather than remove the yellowness of the print. Bichromate of potash requires for its solution ten times its weight of water at ordinary temperatures, and chloride of sodium nearly three times, but in this formula equal parts of all three are given, which is clearly an impossibility, no doubt due to a misprint.

If the bichromate method of bleaching be adopted, and in many respects it is the one to be preferred, since it leaves an image consisting virtually of pure silver chloride, it is not desirable, nor is it necessary, to employ the chromium salt at anything like the strength represented by a saturated solution. A much weaker solution than this will give a strong yellow coloration to the print that will require repeated and prolonged washing in acidulated water to remove it, whereas with a weaker solution still, the stain is easily removed by the sulphite in the subsequent development. The chromic salt does not appear itself to take any part in the bleaching process beyond starting it; the chromic acid set free by the HCl (or other acid) employed probably attacks the image-forming silver chromate, which is at once decomposed by the HCl or chlorides present, and the chromic acid is again set free to act upon a fresh portion of the image, and so on until the process is complete. Thus, while a comparatively small quantity of bichromate and of hydrochloric acid suffices to set up the action, the real work of bleaching or converting the image is performed by the relatively harmless chloride of sodium, and the solution should therefore be compounded on those lines. In other words, just sufficient bichromate and free acid should be used to attack the image in a reasonable time, and a sufficiency of soluble chloride to easily convert the whole of the silver contained in the print or prints to be treated, bearing in mind, however, that chloride of sodium and the soluble chlorides generally are more or less solvents of silver chloride.

For the latter reason it is preferable to employ a large volume of solution rather than a smaller quantity in a more concentrated form, as if the latter plan be followed the probability is that the first portions of silver chloride formed will be held in solution to be gradually reprecipitated over the whole surface of the print as the soluble chloride becomes exhausted, with the result that the after development effects a reduction of silver in the whites of the print, and a consequent degradation that is as objectionable as the original yellowness. My attention was first directed to this danger by noticing that some bleached prints left in water and exposed to weak daylight became uniformly tinted just as ordinary unfixed prints would under the same conditions, and on investigating the cause I traced it to the use of a small volume of over-concentrated solution.

Another danger that may arise from the use of too small a bulk of solution of safe strength is that the soluble chloride may be exhausted or nearly so before the image is completely



BURNING SEA WEED BY H. TOLLEY

bleached, in which case the chromic acid itself attacks the image, or, rather, the solution is not strong enough in chloride to react upon the chromate of silver formed; and this being partly soluble in water is gradually dissolved out, and the image thus weakened or altogether removed. Hence I repeat—safety and success lie in the direction of a considerable volume of solution of low strength.

The plan I adopt myself is to make a concentrated stock solution of bichromate and salt, slightly acidulated with either hydrochloric, nitric, or sulphuric acid, whichever happens to be most convenient or handiest, for in the presence of the soluble chloride it matters not which acid is employed to bring the chromic acid into active condition. Of this stock solution I add sufficient to, say, half-a-pint of water to give it a strong yellow color, and to cause it to show signs of acting on the print in something less than a minute's time. The print or prints are moved about in this as in toning, and small quantities of the stock solu tion added from time to time as the action appears to lag. If this course be adopted, there will never be a sufficient strength of salt present to exert any appreciable solvent action on the silver chloride, while there will always be a sufficient quantity to decompose the chromate of silver as formed. Of course, the bleaching takes longer, but this is a disagreeable necessity that must be put up with if the final result is to be satisfactory. The stock solution may conveniently consist of one part of bichromate of potash and two parts of chloride of sodium in twelve or fifteen parts of water rendered very faintly acid.

The action of this solution does not completely remove the image even from an untoned print; there is always a faint trace of something left apparently in the body of the paper, but with a *toned* print the gold portion of the image that remains is, of course, plainly visible of a dirty slate color, though it perhaps falls far short of the strength it might be supposed to possess, considering the influence it has on the color of the print. Therefore it is not necessary to continue the bleaching action in the hope of obtaining a perfectly white sheet of paper; a very little experience will teach when the action is complete, after which the print must be very carefully washed to remove as far as possible the bichromate left in the paper, which will otherwise give rise to inequality in the action of the subsequent development. A slight yellowness, differing entirely from that produced by sulphuration, will probably resist all washing, but this need cause no trouble, as it will disappear at an early stage



SENTINELS OF THE MOUNTAINS BY H. TOLLEY

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of development, owing to the action of the sulphite in reducing the chromium salt.

Any developer of the "chemical" class may be employed, but, naturally, the preference will be given to those which, unlike pyro, develop without chance of stain. Pyro, if combined with sufficient sulphite to give a stainless result on film and paper, will give just as good a tone as any, for, contrary to what might be supposed, the developer has very little influence in altering the color of the restored image, strange as it may appear. The paragraph anent Herr Kopecky's plan speaks of developing with hydroquinone "for a blackish tint." As a matter of fact, it is extremely difficult to get such a color with any developer under any circumstances when "restoring" either an albumen or a gelatino-chloride print, or when operating upon an untoned print of either sort.

When I first published my experience with this process I commented upon the curious fact that the bleaching and redeveloping operations had practically no effect upon the original tone of the print. If originally purple, purple it was restored, and if brown, brown, while a fixed but untoned print, if so treated, is only with the greatest difficulty induced to take any but the disagreeable brown color it presented on leaving the hypo bath. It seems to me that everything depends upon the molecular condition of the silver forming the image. The bleaching and redevelopment do not in any way modify this condition, and the image is restored in precisely its original form; and in the case of a gold or platinum-toned picture, the toned portion of the image being also unaltered, the color of the restored picture remains the same as at first.

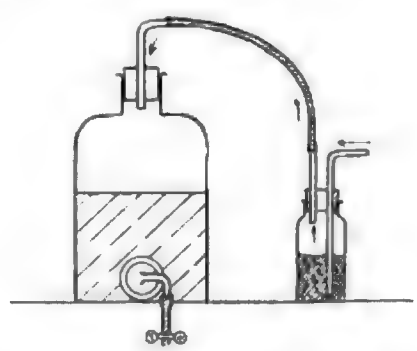
But there is another peculiarity which I have only just discovered. The two prints enclosed with this article were originally identical, but one has been treated by the "restoration" method, with the result that while the general tone is precisely or practically the same, it shows decided symptoms of "double toning" and pinkness of the lights. Now here is the curious part of the business: These two prints were made about three years ago upon a sample of gelatino-chloride paper that would only tone with sulphocyanide, and even with that, after the first few prints of a batch, showed a great reluctance to go past a disagreeable brown color in the shadows, and it was often only by making a fresh bath that an even and uniform tone could be obtained. Although the two prints had been originally successfully toned, the "restored" one, curiously enough, develops the weak points of the paper I have long since discarded.

In conclusion, although I am not prepared to say that this method will prove an infallible and perfect cure for all cases of fading in either albumen or gelatine, I am sure it will in the majority of cases effect a great improvement, and I think stop the print in its downward track. And if carefully worked, bearing in mind the caution I have given, it may be undertaken with the most perfect safety even on pictures of value.—*Photography*.

HOW TO KEEP STOCK SOLUTIONS. BY C. F. TOWNSEND, F. C. S.

So many of the solutions used in photography deteriorate under the influence of light and air that it is well to know of good methods for preserving them in their pristine condition.

As regards the action of light, it is an advantage of course, to keep the solution in orange glass bottles, but it is far safer in any case to put the bottles in the cupboard. Where a



bottle is often in use and exposed to the light, the best plan is to paste thick brown paper round the bottle, which makes an excellent shield. The following are the principal solutions requiring protection: silver nitrate, ferric oxalate, potassium iodide, varnishes, all stains and dyes.

Deterioration by exposure to the air is much more difficult to guard against than by exposure to light, but the difficulty can be overcome with a very small amount of trouble. The usual practice when making up a stock solution is to put the whole of it into one, or perhaps two, large bottles with more or less dubious corks or stoppers. During working hours the bottles

get warm, the contents, especially the air above the surface of the liquid, expand, and some of the air is driven out through the interstices in the cork or round the badly-fitted stopper. During the night the contents of the bottle contract as they get cold, sucking in fresh air. If the bottle contains pyrogallic acid, ferrous sulphate, or any other developer or oxidizable material, the oxygen in that air is absorbed by the solution, which deteriorates accordingly. Every day this expulsion of exhausted air and fresh influx of air containing more oxygen goes on until the solution is rendered completely useless. Even if the stopper or cork be tight—a rather unusual state of things—a fresh supply of air is admitted every time some solution is taken out of the bottle. As the level of the liquid in the bottle is lowered, the air-space increases, until, if the bottle be a large one, the solution might almost as well be standing in an open dish.

There are two ways by which this state of things can be remedied. If the family bathroom is used at uncertain intervals as a dark-room, it is inconvenient to have any arrangement that requires fixing, so that the best thing for the amateur to do in this case is to fill a number of 3 or 4 oz. corked bottles with his stock solution. When corked, some paraffin candle ends or a quarter of a pound of white paraffin wax (to be obtained at the oil shop) should be melted up in an iron ladle or a tin box, and the tops of the bottles should be dipped into it so as to completely seal the cork. It is much better to use paraffin than sealing-wax, as the former soaks into the cork and fills up all the air passages; besides this, the paraffin does not chip and can be easily removed. For many purposes, by the way, it is useful to close the air-spaces in the cork by soaking in paraffin, but such corks must never be used for liquids such as benzene, varnishes, etc., that will dissolve the paraffin.

Stock solution of any oxidizable material stored in the manner just described can be kept indefinitely. When one of the bottles is opened the deterioration extends only to that particular portion instead of to the whole stock, as always happens when stored in bulk in the usual way. The above method, however, is inconvenient where comparatively large quantities are used. In this case it is well to employ a large containing vessel, capable of holding, say 10 litres or 2 gallons. This vessel should be closed by a cork—preferably of india-rubber—at the top and should have a tubulure in the side, about an inch above the bottom. The latter opening should be closed by a good cork with a single glass tube passing through it, to which is attached an india-rubber tube by a brass pinch-cock or a screw clamp. Through this rubber tube the stock solution may be drawn off, either into the usual measuring glass, or, better, into a fixed burette. Through the cork at the top of the vessel passes another glass tube, which is connected by means of india-rubber tubing to an oxygen-trap. Whenever any liquid is drawn out of the stock vessel, no air can get in to replace it except through the oxygen-trap. As the air reaching the large vessel contains no oxygen, it has no effect upon the liquid, which keeps in good condition for an indefinite time.

There are several forms of oxygen-trap, but the principle of all is the same. The simplest form, which can be easily made at home, consists of a small wide-mouthed bottle, holding say, four to six ounces. Two tubes pass through the cork (see sketch), one—the inlet tube—reaching nearly to the bottom of the bottle, the other terminating just below the cork. The bottle is half filled with broken glass or beads, saturated with strong stock pyro-soda developing solution, containing both the pyrogallic acid and the alkali, which effectually removes the oxygen from air passing through it.

Another form of oxygen-trap consists of a tube passing through the cork of the stock container attached to a bulb and inlet tube bent so as to form what engineers call a "seal." The same form can be purchased fixed on a wooden stand, and is largely used in the analysis of gases.

Potassium cyanide deteriorates rapidly in contact with air, the carbonic acid present in the air turning out the hydrocyanic (prussic) acid from the cyanide, so that if large quantities of cyanide solution are made up they should be cut off from the air by a trap containing a solution of caustic potash or soda, instead of pyrogallic acid and an alkali. Of course this does not apply to sulphocyanide or ferro or ferri cyanide solutions, which are not affected injuriously by the air.—*The Amateur Photographer*—(English)

The Preservation of India-Rubber.—It is stated that the rubber tubing and balls attached to shutters, etc., may be prevented from getting stiff, when not in use, by giving them a coating of stearine, obtained from a hard stearin candle.

THE ADVANTAGES OF LENSES WITH A ROUND FIELD.—BY REV. T. PERKINS, M. A.

Opticians for many years have been striving to flatten the fields of their lenses without introducing astigmatism, and during the last few years several, both in England and on the Continent, have succeeded in their endeavors, thanks in great measure to the greater variety of glasses they have now from which to select; something more has indeed been done, as I have seen some lenses in which the field has been slightly convex instead of concave to the lens. If a lens could be produced with good marginal definition with a large aperture, and free from astigmatism, with a field still more convex than those I have seen, then the photographer would have every kind of lens he could desire, and the optician might rest on his oars.

The lenses at present existing will do all that the landscape photographer who aims at artistic results can desire. Nay, he can do much of his work without any lens at all. The peculiar softness given by a pinhole far exceeds in beauty that produced by a lens possessing diffusion of focus, and were it not for the exceedingly long exposures required which prevent the representation of any object likely to move, whether human being or animal, or cloud in air, or ship on sea, the pictorial photographer could advertise all his lenses in the sale and exchange columns of the *Amateur Photographer*; but since shortness of exposure is a great desideratum, some lens will be needed in most instances until such times as plate makers put on the market plates marked with H. and D. speed numbers of about 10,000. Whether those times will ever come is uncertain, but even were they to come, the difficulty of watching the development of such exceedingly sensitive plates without fogging them would be a serious drawback to their use. But almost any kind of lens may be used for the purpose; a simple uncorrected single meniscus, or an ordinary achromatic landscape lens, provided it does not suffer from flare spot, as many of the cheaper lenses do, will suffice But when we come to work in which fine definition is a necessity, then the newer lenses, the outcome of mathematical calculation and practical experiment aided by the advances made in the manufacture of optical glass, place in the hands of the photographer powers scarcely dreamed of thirty years ago, and then declared by theory to be utterly unattainable.

Let us consider the comparative advantages of the three classes of lenses of which I have spoken: (1) Those of the ordinary type with fields concave to the lens; (2) those whose field is flat; and (3) those with fields convex towards the lens.

Lens of the first class are specially useful for many subjects; they enable the landscape photographer to get any amount of sharpness of definition in his foreground, while preserving sufficient sharpness of definition along the distant horizon, epecially when he uses his plates vertically, and embraces only a moderate horizontal angle; and sorry indeed should I, as an architectural photographer, be to part with any of my rectilinear lenses of early make, for they are exceedingly useful in interior work, when the most distant objects occupy the center of the plate, such as is the case when a general view of the interior of a church is taken from one end, for with them, without excessive stopping down, the east window can be sharply focused, and at the same time the arcading on either side and the roof of the nave well defined. But the disadvantages of these lenses are plainly seen when the different objects included in the view are arranged in just the opposite way, when, for instance, an exterior view of the same building is taken from the south-east, from which point the church will be seen in angular perspective; and the south-east corner of the chancel will be the nearest part of the building to the camera. If this is sharply focused the western tower will be sadly wanting in definition, and stopping down will have to be resorted to to cure this defect. As the light outside is stronger than that within the building, this method may in this case be employed without any serious inconvenience, but it is different when in an interior subject, some near pillar occupies a prominent position not far from the center of the plate, then the more remote portions of the arcading will be out of focus, and the advantage of a lens of the third class will be felt. Even a flat field lens will mend matters to some extent, and will not require so much stopping down as one of the ordinary type. The larger the aperture that can be used without loss of definition the better for interior work, for a small aperture means a long exposure, and this is to be avoided whenever possible, partly because of the inconvenience of waiting so long, and still more because dur-

ing a long exposure the sun changes its place, so as to alter considerably the lighting of the subject. It is surprising how great a change even a quarter of an hour will sometimes cause in this way Once when I was photographing inside Christchurch Priory a beam of sunlight which fell outside the field of view included on the plate when the exposure was begun, before the end had traveled eastward across the floor and walls that were represented in the picture, causing an ill defined mass of light upon the walls and pavement.

A lens with an absolutely flat field is used with the greatest advantage in copying maps, or plans, or paintings, in enlarging or reducing, in projecting lantern slides upon the screen. For negative making it is just the thing when a door, a window, a piece of carving on a flat wall—a reredos, for instance—has to be taken full on, that is with the axis of the lens perpendicular to the flat surface ; but with these exceptions few subjects occur in which full advantage can be taken of the peculiar characteristics of lenses of this class

From what has been already said, it may be easily seen how useful a lens of this third kind would be. In many compositions the nearest and chief object occupies a position not indeed exactly equi-distant from the right and left hand sides or ends of the plate, but yet not very far removed from this position, and it will, I think, be allowed that the principal object should be the best defined part of the picture, but at the same time we may not care to have the more distant objects on either side utterly out of focus, as they might be if an ordinary lens with a concave field, and to a less extent if a flat-field lens were used. For such subjects a lens of the third class, could it be procured, would be admirably suited ; and as I have already mentioned, such a lens would be an inestimable boon to the photographer who is fond of photographing architectural interiors, for one does not always want to take general views of the interiors of cathedral or parish churches from the east or west end : details form most useful and interesing subjects, and in many of these the central objects are nearer to the lens than those which occupy the sides of the picture. This will be the case when, for instance, a pillar, or an altar tomb, or a font has to be represented Let us hope that this want will soon be supplied, and a lens with a convex field be placed on the market, for then tl e architectural photographer will be able to fully equip himself for any work that he may desire to do.—*The Amateur Photographer*.—(English).

NOTES ON INTERIORS. BY "SCRAMASAXE."

BEGINNERS are often told that it is next to impossible to over-expose in the case of interiors. But it is as possible to over-expose even on a dull day in January, even in an interior panelled in dark oak, as it is to get signs of halation on a plate specially prepared to prevent it.

In photographing a dark interior it is some times difficult to focus exactly. In such cases it is a good plan to light a lamp or candle and focus the candle-flame. Another method is to tear the front page title off a newspaper and pin it to the wall upside down. With the help of the artificial light it will be easy to focus the bit of paper. The piece of paper must be taken down before the plate is exposed, or the effect will be more curious than beautiful. The lamp may be left burning so as to light up the darkest corner of the room, and relieve the depth of the shadows. Any cross-lightings should of course be avoided. They may easily escape notice while focusing, but they will make themselves painfully visible in any print.

If a wide angle-lens requires to be fitted with



AN ITALIAN STREET VENDER BY DEXTER THURBER

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YERKES OBSERVATORY, UNIVERSITY OF CHICAGO

WILLIAMS BAY, WISCONSIN

a shutter, the best plan is to have a disc of wood turned with a hole in its center so as to fit on the front of the lens, and with the outside circumference of the disc turned to fit the shutter that is deemed most suitable. The bigger the shutter the better, for if the working aperture in the shutter be too small, some of the view will be cut off, and the negative proportionately spoiled. The shutter should also be as shallow, *i. e.*, as thin from back to front, as is possible, or the same defect in the negative may be caused.

The shutting of a door during the photographing of an interior does not matter, provided that when opened again it can be put exactly in its original position for the rest of the exposure. But in photographing a door, behind which there is a room with a strong light, such as that coming from a conservatory, it would be wisest to lock the door, as the strong light, even if it were allowed to pass through the door a very short time, would show up in the resulting negative in a ghostlike form on the door.—*The Photographic News.*

"Sunlight and Shadow." Under this title Wilson's photographic magazine for November prints a several page review of Mr. Adam's new book of the same name. The following is extracted from this review:

The work comprises a progressively arranged series of fourteen chapters dealing with photography indoors and out, and is embellished with a hundred half-tone engravings. In his preface Mr. W. I. Lincoln Adams, explains that the book is intended to aid the more advanced photographer by precept and example, and it would be difficult to imagine a more delightful introduction to pictorial photography.

Chapter I. deals with "The Choice of Subject," and is contributed by Mr. Xanthus Smith. It is illustrated with pictures by A. L. Eidemiller, H. P. Robinson, and A. Horsley Hinton. Mr. Adams follows this with a chapter on "Landscapes Without Figures," making his subject attractive with examples of landscape work by W. H. Dodge, H. Troth, Dr. J. Meiner, Alfred Stieglitz, and other amateurs of note. The frontispiece of the book "In Prospect Park," by the editor, is a charming piece of work and conveys many lessons for the outdoor worker.

Chapter III. deals with "Landscapes with Figures," giving the experience of the editor and Mr. Andrew Pringle in this difficult work. The illustrations represent the work of Alfred Stieglitz, Seymour Conway, Count von Gloeden, and Jesse Poundstone.

"Foregrouuds," forming Chapter IV., is from the pen of Mr. H. P. Robinson, and is written in the veteran's usual illuminating way. It is one of the best chapters in the book, and contains a number of illustrations chosen by Mr. Robinson to elucidate the text. The full-page picture, "A Wet Day on the Boulevard," by A. Stieglitz, accompanying this chapter, is perhaps the happiest effort of this well-known amateur. In Chapter V. Mr. Robinson treats of the "Sky" as the keynote of pictorial work outdoors. Although he begins by criticizing somewhat severely American landscape photography, Mr. Robinson conveys many lessons which are needed, and the chapter is one which ambitious picture-makers will do well to read and re-read.

Mr. John Bartlett contributes the sixth chapter of the book, with "Outdoor Portraits and Groups." Those who are familiar with Mr. Bartlett's writings need not be told that this is a subject with which he is peculiarly fitted to deal. The illustrations are by Mabel Osgood Wright, Alex. Keighley, R. Eickemeyer, Jr., H. K. Noyes, and Alfred Stieglitz.

"The Hand Camera" is reached in Chapter VII., and gives the experience of Mr. Alfred Stieglitz. The illustrations of great beauty and attractiveness, are contributed by the writer of the chapter and deserve special attention as object-lessons in hand-camera work.

Chapter VIII. most appropriately touches upon "Instantaneous Photography," and is from the facile pen of Mr. Walter E. Woodbury, the editor of the *Photographic Times*. The exposure tables for objects in motion, included in this chapter, will prove of great service to those attempting this difficult branch of photography.

"Winter Photography," by Mr Adams, instructively fills Chapter IX. It is illustrated with nine excellent examples of snow and ice photography.

"Marines" is the heading of Chapter X, and the subject is treated very fully by Mr. H. P. Robinson and Dr. J. M. Bemis, who each contribute several examples of marine work worthy of study. The tail-piece of this chapter, "The Sea," by Harry Platt, is one of the most masterly pieces of photography in the book.

In Chapter XI., Mr. W. A. Fraser, whose views of New York by night have recently attracted so much attention at the exhibitions, gives his method of working when photographing outdoors, after dark, in all sorts of weather. This is, we believe, the only exposition of the subject so far published. It is illustrated with a half-dozen night pictures by the author.

Professional photographers will doubtless be attracted by Chapter XII, in which the artist, Mr. J. Wells Champney, gives his method of portraiture as followed in a painter's studio. Mr. Champney writes clearly of his subject, and his remarks will help many to a better understanding of "Lighting in Portraiture." The arrangement and lighting are explained by a diagram to be found in the book.

The thirteenth chapter, on "Photographing Children," gives a number of children's pictures by B. J. Falk, of this city. One of these entitled "Child Study," should be seen by all interested in the subject. It is admirable in pose, lighting, and composition. The tail piece of the chapter is a delightful bit of work from the studio of Mr. F. Boissonas, of Geneva.

"Art in Grouping," by Dr. Hemingway, constitutes the concluding chapter of the book. It is largely illustrated with examples selected from paintings by the old masters. These are analyzed and their construction shown for the guidance of the photographer.

The work is printed on heavy coated paper, and bound in art canvas, with gilt edges. Its contents and arrangement do honor to the taste and judgment of the editor. We commend it to our readers as an admirable gift book for the holidays, calculated to give pleasure to anyone interested in photography, from the novice to the veteran in professional work.

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AN INTERNATIONAL EXHIBITION.

The Royal Photographic Society will hold an International Exhibition at the Crystal Palace, London, from April 27th to May 14th, 1898.

Organizing Committee.

Captain W. de W. Abney, C.B., D.C.L., F.R.S., etc., Past President of the Royal Photographic Society; Conrad Beck (R. & J. Beck); Frank Bishop (Marion & Co.); F. A. Bridge; H. H. Hay Cameron; the Earl of Crawford, K.T., F.R.S., etc., President of the Royal Photographic Society; T. R. Dallmeyer, F.R.A.S., Vice-President of the Royal Photographic Society; J. J. Elliott (Elliott & Son, & Fry); W. Gamble (Penrose & Co.); A. Haddon; F. W. Hindley (Jonathan Fallowfield); Chapman Jones, F.I.C., F.C.S., etc., Vice-President of the Royal Photographic Society; J. C. S. Mummery; G. Seamell, Honorary Treasurer of the Royal Photographic Society; John Stuart (Ross & Co.); Paul L. Waterloo (Waterloo & Sons); J. B. B. Wellington (Wellington & Ward); H. Wilmer, C.E., Honorary Secretary of the Royal Photographic Society; W. J. Wilson (Paget Prize Plate Co.); Sir H. Trueman Wood, M.A.; Past President of the Royal Photographic Society. All communications should be addressed as follows: "The Secretary," Royal Photographic Society, 12 Hanover Square, London, W., England. Forms of entry can be obtained from the editor of The Photographic Times.

Preliminary Prospectus.

It is proposed to devote the entire nave of the Crystal Palace, together with such other spaces as may be necessary, to an exhibition of "Photography and its Applications," using the expression in its widest sense. The whole of the arrangements have been placed in the hands of a committee, the names of the members of which have been given, the Committee having been nominated as to one-half by the Council of the Royal Photographic Society, as to the other by the members of the trade and profession at a special meeting called for the purpose.

The exhibition will be formally opened on Wednesday, the 27th April, 1898, and will remain open till Saturday, May 14th following. Every exhibitor will receive a season ticket and a copy of the catalogue.

The various branches and applications of photography render necessary the division of the exhibition into sections, the following being those at present arranged:

I. The History of Photography.

II. Pictorial Photography.

III. Portraiture and General Technical Photography.

IV. Apparatus and Material (Including Machinery in Motion).

V. Photo Mechanical Processes. (Including Machinery in Motion).

VI. Scientific Applications of Photography. (Including Photography with the X-Rays.)

VII. Photography in Colors.

VIII. Photography as a Science.

All exhibitors in Sections III., IV., and V., and those exhibitors in the other sections who are not specifically invited by the Committee to lend exhibits, will be charged as follows:

In the case of exhibits occupying floor space, 1/- per foot for each square foot occupied or reserved. Minimum charge, one pound.

In the case of exhibits occupying wall or screen space, 6d. per foot for each square foot occupied or reserved. Minimum charge, five shillings.

Each exhibitor (except those specially invited to lend objects for exhibition in Sections I., II., VI., VII., and VIII.), will be expected to bear the cost of carriage of his exhibits to and from the exhibition and of fitting up the space at his disposal, and of providing attendant where necessary. But the Committee are prepared to undertake the work for provincial, foreign, and colonial exhibitors, by special arrangement.

N.B.—The above-named charges will constitute the whole of the liability of the exhibitor towards the expenses of the exhibition.

I. The History of Photography.

This section will comprise early results by the various photographic processes, early and obsolete forms of apparatus, portraits of photographic inventors and discoverers, and other exhibits calculated to display the gradual evolution of modern photography from the earliest discoveries.

It is anticipated that there will be in this section, more particularly

(1) As complete a series as possible of the various forms of lenses, with diagrams of their construction and specimens of work done with each.

(2) Obsolete or superseded forms of cameras and other apparatus.

(3) A Daguerreotype studio in operation.

(4) Examples of early photographic processes, and of processes now obsolete or superseded.

(5) Early examples of photo-mechanical apparatus and results.

(6) Collections of photographs by early workers.

(7) Photographic literature.

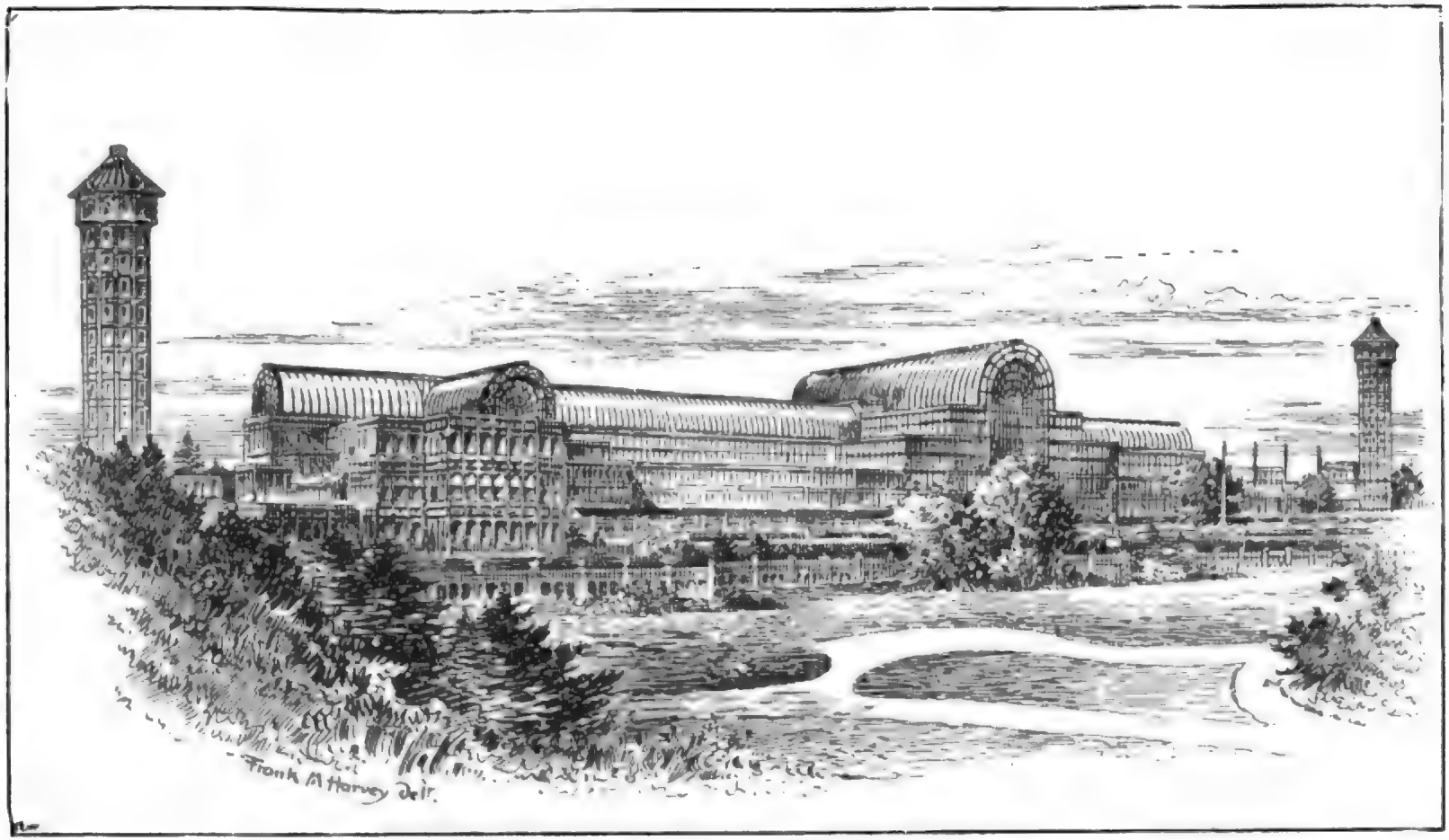
N.B.—It is requested that possessors of apparatus or pictures (negatives or positives) of historical interest will communicate with the Committee. There will be no charge made for exhibits under this head, and the Committee are prepared to pay all expenses of carriage on objects accepted by them for exhibition.

II. Pictorial Photography.

A Loan Collection will be arranged with a view to display the present position of Pictorial Photography.

III. Portraiture and General Technical Photography.

In this section will be included exhibits of general photography, portraiture, landscape, etc. It is open to all photographers, and it is to be hoped that many portraitists will exhibit on a large scale in this section, to which a very important proportion of the space available will be devoted. The exhibits will not be submitted to a Committee of Selection, but the Organizing Committee reserve the right to reject any work they consider unsuitable from inferior technique or from any other consideration.



THE CRYSTAL PALACE, SYDENHAM (*Near London*)

WHERE THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION WILL BE HELD.

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It will include—

(1) Examples of portraiture, landscape, and architectural work.

(2) Specimens of photography produced under exceptional difficulties or by means of special apparatus.

(3) Transparencies, lantern slides, and enlargements.

(4) Ceramic photographs and enamels

(5) Illustrations of processes of every kind, including diazotype, ferro-prussiate and kindred processes for copying drawings, etc., etc.

(6) Demonstrations of various photographic processes.

(7) Models of studios, methods of glazing, studio accessories, etc.

(8) Photography by artificial light.

(9) Methods of printing photographs rapidly and in quantity.

IV. Apparatus and Material.

In this section manufacturers and dealers are specially invited to exhibit. A plan of the area assigned to it and to Section V. will be prepared, and can be obtained at the Society's offices, showing the method of subdivision.

It is anticipated that this section will include—

(1) Apparatus and appliances of every sort used in the production and display of photographs: Plates, papers, chemicals, apparatus for coating plates and paper, etc.

(2) Machinery in motion, showing the various processes employed in the manufacture of lenses, cameras, etc

(3) Illustrations of the work produced by the apparatus and materials shown.

(4) Animated photographs and apparatus for their display.

V. Photo-Mechanical Processes.

This section will comprise all exhibits relating to the processes classed as photo-mechanical, *e.g.*, photogravure (intaglio), line and half-tone photo-engraving, collotype, photo-lithography, photo-zincography, Woodburytype, etc., etc. A plan of the area assigned to it and to Section IV. will be prepared, and can be obtained at the Society's offices showing the method of subdivision.

It will also include examples of letter-press printing which includes half-tone work, journals and books produced partially by photography, drawings made with a special regard to their being reproduced photographically, textile and paper-staining processes, and photo-mechanical and three-color printing processes.

N. B.—It is hoped that as many as possible of the processes will be actually shown in operation.

VI. Scientific Applications of Photography.

In this section will be included the various scientific uses to which photography is put.

It is expected that among other exhibits will be—

(1) Photo-micrographic apparatus of the latest designs, photo-micrographs, micro-photographs, etc.

(2) Astronomical photography. The complete mounting for one of the instruments now employed in mapping the heavens. Space will be placed at the disposal of the leading observatories in the world.

(3) Photographic recording instruments and photographic records.

(4) Military photography (including the photography of projectiles, photographic surveying, and balloon photographs).

(5) Engineering photography.

(6) Medical photography, including photography with the X rays.

(7) Subterranean photography.

(8) Meteorological photography (Clouds, lighting, etc.).

(9) Spectroscopic photography.

(10) Instantaneous photography applied to the movements of animals, and to the phenomena of rapid movements, etc.

(11) Composite physiognomy.

(12) Geological photography.

(13) Metallurgical photography.

VII. Photography in Colors.

This section will comprise color photographs and apparatus for producing and seeing color photographs by whatever method produced.

VIII. Photography as a Science.

In this section will be included examples of results obtained by different experimenters in carrying out scientific investigations connected with photography *e.g.*, Examples illustrative of chemical and physical processes and investigations bearing on photography: Experimental plates and apparatus employed in devising the various systems of plate speed measurement A similar collection with reference to the production of orthochromatic plates, etc , etc.

N. B.—The committee request that the possessors of any objects of interest coming under this heading will communicate with them. There will be no charge made for exhibits in this section, and the committee are prepared to pay all expenses of carriage on objects accepted by them for exhibition.

The Working Life of a Cinematograph Film.—Under this title *La Nature* has some striking remarks upon a little-thought-of subject—the efforts and work actually spent in obtaining an often ephemeral result, and cites the cinematograph film as a case in point. In a kinetoscope each of the views that pass before the spectator's eye is only lighted, and consequently utilized, for about the $\frac{1}{4000}$ of a second. Now, seeing that each film may be used, say, 4000 to 5000 times before becoming unserviceable, it follows that the real active life of each view is less than a second of time. In the cinematograph the pellicle is illuminated for a longer period, about $\frac{2}{3}$ of a second, seeing that they pass at the rate of about fifteen per second, and each one is exposed for two-thirds of $\frac{1}{15}$ of a second. Further, because of the jerky movement of the film, it cannot pass through the instrument beyond 300 times without being damaged too much for further use. In consequence, its actual life is about a second and a third, less, in fact, than that of a piece of fireworks, which has an existence of several seconds.—*British Journal of Photography.*

PRINTS IN TURNBULL'S BLUE.

BY OSCAR BOLLE.

[*Translated from the Photographisches Wochenblatt in The British Journal of Photography.*]

The efforts of amateur photography have been chiefly directed to new printing methods, which, by variety of tone, surface, and finish, would afford the means of adaptation to the subject, and thus supplementing the old printing processes characterized by brown tones and highly glazed surfaces. At the same time the endeavor has not been excluded to increase the quality and permanence of the print. Art photography must remind us as little as possible that its productions are mechanical, and to-day the desideratum is that they shall appear "unphotographic." To attain this end, the new school has already devised a number of most diverse printing processes, of which doubtless, photogravure yields the most artistic effects; yet the difficulties by which it is surrounded remove it from the sphere of many. Some have sought, by more simple or cheaper means, to obtain similar effects, and from time to time fresh processes are published.

A printing method that may be classed with those we have characterized is the process in Turnbull's blue. Although first recommended by Herschell in the forties under the name cyanotype, little attention has been bestowed upon it by photographers. Yet it may be termed almost classic, within the limits of its splendid cobalt blue color, if we think of its wonderful simplicity, its great cheapness, and the quality and permanence of its pictures, rendered, as if by magic, in intense blue upon pure white paper, and in such a manner that neither hot nor cold water will affect them. The skilful amateur can produce a print in eight or ten minutes upon any sheet of paper that may take his fancy. This time will suffice to prepare his sheet of Rives writing or letter paper, to make a print, fix it, and then dry it off by heat. When travelling, the process is most acceptable, if we wish to make a print quickly and without trouble, from a fresh negative. But these considerations do not concern me at present, my aim being to point out that the process may be used for making most serviceable, effective pictures, if the subjects are suitably selected.

The fine blue color of these pictures is Turnbull's blue, a precipitate insoluble in water, produced by the admixture of solutions of red prussiate (ferricyanide) of potash and ferrous salts. The production of the picture is explained as follows: If light is allowed to act upon certain salts of iron, in which the metal is present in the ferric state, they are reduced to ferrous combinations, which give, with red prussiate of potash, the above-named blue insoluble precipitate (Turnbull's blue). Ammonia citrate of iron is one of these iron salts. If a solution of this is mixed with a solution of red prussiate of potash, no precipitate is at first formed, but we have a yellowish brown fluid. If this is brushed upon paper, dried, and exposed to light, the ferric salt is reduced to the ferrous state, and, in conjunction with the red prussiate of potash, produces the blue precipitate, Trunbull's blue which becomes apparent upon immersing the paper in water. Both salts are then in solution, and combine more readily. If the exposure has been made under a negative the reduction will correspond to the amount of light transmitted and those portions that have been protected will be freed from the mixture of ferric salt and ferricyanide of potash, when the prints are washed.

Plain and simple as this explanation may seem, it was discovered with much difficulty. In 1724 a process was discovered, by accident, of making a similar blue dye stuff, Prussian blue, also a cyanogen combination; but more than a hundred years passed away, until in recent times, with much labor and strenuous investigation, theoretical chemists obtained a complete insight of the chemistry of the cyanogen combinations, which to-day play such an important part in the arts. This also enabled them to explain processes such as the one under consideration and to perfect them.

A very important factor in the success of good prints is the quality of the paper. Papers of different make will give different results although similarly prepared. A good paper made from rags and having a woolly appearance by transmitted light should be used. It should contain but little wood pulp, should be lightly sized, and not highly glazed. Plain Rives paper (a rather thick kind weighing 19 kilos, unsized) is the best, but Steinbach's or Schleicher & Schüll's of Düren, or even that which is known amongst the best stationers as normal writing paper, No. 1 are also quite suitable. The paper is fastened upon a drawing board with drawing pins, a sheet of blotting-paper being interposed. It will be found advantageous, especially with kinds having close texture, to first dip the sheets in water, and dry them off between blotting-paper, to render them more manageable.

The coating of the paper with the solution must be done very evenly, so that there may be no brush marks or insensitive patches. The brush must be perfectly clean. I prefer to use a thick, short, soft-haired brush, such as is used for varnishing. If a large surface has to to be prepared, the solution may be first spread upon the paper with a sponge and then equalized with a brush. Sizes up to 25 x 33 c., quarter-sheet of Rives, can be prepared with greatest success and evenness. Flotation for three to five minutes upon the solution is also a successful method. The drying may take place in the air, in an oven, or before a fire. The sensitizing must be done by gas or lamp-light, or by very subdued daylight, and the paper must be dried in the dark.

Printing must be done in diffused daylight, under tissue paper, or in direct sunlight. The print is finished when the shadows assume a silver-gray or bronze tone.

Development takes place by simply washing in water. It is preferable to begin with tepid water and to use frequent changes, to obtain pure whites and to prevent any subsequent degradation. The prints thus obtained are permanent, and can be dried in any way that may be desirable. They are of a very fine, plucky, dark blue color, with a coppery lustre in the shadows, and can be modified to other tones.

For the sensitizing solution mix by artificial light:—A. 15 grammes green ammonio-citrate of iron* in 50 c. c. water. B. 8 grammes red prussiate of potash in 40 c. c. water. Filter both solutions, mix and keep them in a yellow bottle in the dark. The addition of 1 gramme of bichromate of potash to each 900 c. c. of solution in-

*There are green and brown varieties of ammonio-citrate of iron, and for some time past preference has been given to the green, owing to its greater sensitiveness. The chemicals may be obtained from J. F. Schippang & Co., 24 Prinzenstrasse, Berlin.

creases the keeping property of the paper. The solutions will keep a long time, likewise the mixture, but the latter must be filtered frequently. The solution of ferrid salt by itself inclines to mouldiness, but I prevent this by adding five per cent. of alcohol. Other antiseptics are injurious to the solution.

The prepared paper is yellow with a slight greenish tinge. It must be preserved carefully from daylight, and will not last long.

If pure chemicals are used, to which special attention should be given, the mixture is a clear brownish-yellow. If the red prussiate is insufficiently pure, the solution is yellowish-green, instead of brownish-yellow, and the salt is unsuitable. By warming and adding a few drops of bromine water, which may be had at any chemist's, the requisite condition may be restored, in the same way as the red prussiate is manufactured from yellow prussiate of potash, with chlorine or bromine. Hence paper that has been strongly bleached with chlorine is not undesirable with this process. If the crystals of red prussiate are decomposed at the surface (greenish), they should be washed before use. The ammonio-citrate of iron may also be impure and contain ferrous salt, the mixture is then a pronounced green-blue color and produces bad prints.

If it is necessary to intensify prints, they should, after careful washing, be dipped in a weak solution of chloride of iron (about five grains to the litre of water). Ferric citrate or ferric sulphate in similar weak solution will also answer the purpose, likewise dilute hydrochloric acid.

I have found that dipping the prints in a solution of sulphocyanide of potash and subsequently washing will intensify the tone, and at the same time give greater vigor to the print.

On the other hand, prints may be reduced by prolonged washing, immersion in a weak soda bath, or very dilute ammonia. Oxide of iron being thrown down from the decomposed Turnbull's blue, the prints have a gray tone, but this may be removed by dilute hydrochloric acid.

To make corrections or write inscriptions on the prints in white, a solution of oxalate of potash (4 grains in 100 c.c. water) may be used.* To write in other colors, a transparent solution of suitable dye must be added.

For retouching the picture, the color could easily be prepared by the photographer, as it is well known that ferrous salts (for instance, ferrous sulphate), with red prussiate of potash, produce the blue precipitate, the ferric salts with yellow prussiate. But I may mention that I have filled in small defects with greater ease and safety with blue pencil or color.

Prints in Turnbull's blue will be used mostly for small sizes not exceeding 13 x 18 c., as the cobalt blue would be very intense with larger sizes; but is it different where we have the possibility of changing prints made with such ease to a neutral color, by an equally easy procedure. The following few directions will make the process of greater value to many.

If tobacco smoke is blown on a blue print, it will assume a transitory, beautiful lilac tone. I have obtained this lilac color in various shades in a permanent way by laying the print in a hot solution of acetate of lead (liquor plumbi subacetici, sp. gr. 1·24, obtainable at any chemist's).

Very short immersion in a cold bath of the same will also produce a marked change of color. After this bath, the prints should be well washed. Upon dipping these blue-lilac prints in a thirty-five per cent. solution of sulphocyanide of potash, then drying between blotting-paper without washing, I have obtained still different tones upon exposure to sunlight. The prints then assume a more rosy tone.

Weak solutions of borax, oxalate of potash, or ammonia, also produce a tinge of lilac.

The following color variations are interesting, and I have obtained them, by means of a thirty-five per cent. solution of sulphocyanide of potash from Turnbull's blue. They vary between pale and dark moss green, green-black, and violet-black. I immersed the freshly developed blue print (of full vigor, as it loses somewhat) from one to five minutes in the solution of sulphocyanide of potash; the longer the immersion, the paler the result. I also floated the print, image downwards, and then, without washing, blotted it between fresh sheets of filter paper. It was then dried before a fire and exposed to the sun or strong daylight. Up to a certain point the print became lighter, and it then stopped; but, curiously, it recovered in the dark, that is to say, the tone became deeper. This recalls an analogous experience noticed some years ago with ladies' dresses dyed with cyanogen blue. As the sulphocyanide of potash is very readily washed out of the prints, and the tone thereby disappears, these pictures, unfortunately, are affected by water, which will produce spots. They are still more susceptible to ammonia, and as perspiration contains ammonia, it is necessary to carefully avoid touching them with moist fingers (as a precaution I powder my hands); but they are most susceptible to chloride of iron, the slightest trace of which will produce spots. A ten per cent. alum bath and subsequent washing, before using the sulphocyanide bath, produces a rather more fiery tone, and the same bath restores an unsuccessful sulphocyanide picture to the original blue.

The finest effect, however, is obtained if a few drops of acetate of lead are added to the sulphocyanide of potash bath, in which the print is being rocked. After a few minutes the print should be removed and pressed between clean filter paper, then dried before the fire and exposed to light. A peculiar brilliant black is obtained, passing over to lilac in the high lights, and the print is of exceptional vigor. The bath must be fresh for each set of prints, as it rapidly decomposes, and it should be made with care, as directed. Numberless variations of color are possible, according to the amount of lead acetate, length of immersion, etc. The print should be mounted with thin glue or gum arabic.

The bright tone will be found very pleasing, and I believe the process will be of use, notwithstanding its drawbacks; but, for success, it is necessary to adhere strictly to definite periods of immersion, to the drying and exposure of the prints, and also to see that the materials and paper are of the purest, and that the utensils are perfectly clean.

* This reducing property of oxalate of potash might well be used to produce pen drawing from the blue print. If the drawing is made over the blue print in Indian ink, and the print then immersed in oxalate of potash, the photograph would be destroyed and the pen drawing remain.

USEFUL HINTS.

From The Amateur Photographer (British) Note Book.

To Strengthen Alcohol.—Alcohol that has been used to dry negatives soon becomes diluted with water to such an extent as to be almost useless. If the diluted spirit be put into a clean bottle containing an ounce or so of well dried potassium carbonate, a few minutes' vigorous shaking will cause the water to leave the spirit and become absorbed by the potash. The bottle should then be left to stand for an hour, when the alcohol can be decanted from the heavier solution of potash, which will remain at the bottom. The potash can then be collected and dried in an oven, and will then be ready for a similar purpose on another occasion.

Starch for Mounting Prints.—Many workers regard starch as the best mountant for all kinds of photographic prints, while there are others who think it is almost useless for the purpose, for, they say, it is not nearly sufficiently adhesive. It is quite possible that this discrepancy may be due to the different ways in which they mix their starch. It would seem that to make a cupful of starch paste were one of the simplest things in the world, and so it is, but the starch must be made properly if the print is to stick to its mount without betraying any desire to curl up at the edges. Here is a recipe which, if carefully followed, will never fail. Into a teacup made of *thinnest* china, put as much good dry starch as can be heaped on to a teaspoon. Gently fill with cold water, and after a few seconds pour away again all that has not been taken up by the starch. The result should be a mass of wet starch, which is just sufficiently mobile to be stirrable. If it be too thick, water may be added drop by drop to bring it to the right consistence, but if too thin it is better to throw it away and start again. Now stir vigorously *with a fork* to prevent the formation of lumps, and very slowly pour in boiling water—really boiling. Watch carefully for the first sign of thickening, and directly it appears, cease to add more water, and stir away very energetically until the thickening process is quite complete, and a very thick, almost transparent paste has formed.

Printing on Drawing Paper.—Soak the drawing paper for five minutes in a bath of the following composition: the solution must be warm, and care must be observed to prevent air-bells forming on the paper during immersion:

Sodium chloride	8 parts
Gelatine	1 part
Water	450 parts

Hang the paper in a dry place; when dry, it may be stored away for sensitizing as required.

The following sensitizing bath answers well:

Silver nitrate	10 to 15 parts
Citric acid	3 parts
Water	60 parts

The citric acid should be dissolved in 10 parts of the water and the silver in the remainder; the citric acid solution is to be gradually added to the silver solution with agitation. For very strong negatives use 15 parts of silver; use less for weaker ones. The paper is to be toned and fixed in the usual way.

CELLULOSE AND ITS DERIVATIVES.

BY MESSRS. CROSS, BEVAN, AND BEADLE.

(Read before the Royal Photographic Society.)

WHAT has cellulose to do with photography? is a question which may have occurred to many of our present audience, and may express a certain curiosity which accounts for their presence. We, on our part, do not expect to gratify any anticipations which proceed from the "Athenian" desire to hear some new thing. In the first place cellulose is an extremely common substance, and while it is, so to speak, the theatre of many of the most striking dramas of the molecular world, it would be itself popularly described as an extremely uninteresting substance. It is true it discharges a number of important functions in the natural world, and then employs a stupendous amount of capital and labor in fitting it for further uses in the human sphere. But the same might be said, for instance, of water; and it is not to be expected that a substance, colorless, inert, and devoid of positive characteristics, and above all of the commonest, should be able *per se* to excite the imagination. In the domain of science, on the other hand, nothing is "common;" and if a substance plays a large part in the natural order it is entitled to the more consideration. In endeavouring to treat scientific subjects from the point of view of general interest, these aspects always conflict, and the present is not likely to prove an exception. If, therefore, we venture on an "all round" treatment of the subject matter "in the hope that by any means we might save some" who, as yet, are in darkest ignorance of the position and function of this remarkable substance, cellulose, we are sure to offend fellow specialists who are well acquainted with the essential outlines of the subject, but who may expect disclosures of new matter containing suggestions of theoretical or technical progress. *Que faire?*

Perhaps if we address ourselves to the consideration of the uses of cellulose, actual and possible, in photography, we may succeed in getting somewhere near that highest level to which the lecturer can aspire, that is, to offend the least number.

Photographic processes depend essentially upon the two factors, the photo-sensitive substance and the medium through which it is distributed. This holds for photographic action in its widest sense, which is, indeed, of the widest, for it includes the whole arena of light actions.

What radiant energy accomplishes in the plant world we know as an aggregate: but the mechanism of its actions are as yet largely unknown. But here also as in the photographic plate we have the same essential factors, the photo-sensitive substance and the medium through which it is distributed.

In photo-sensitive substances we have the common property of absorbing light energy. The energy appears to undergo that kind of "appreciation" by which it becomes chemical or atomic. We are accustomed to changes of terms, or transformations in radiant energy. A familiar example is afforded by the "incandescent" gas burner: the hood or mantle of the special oxides of which its consists has the effect of changing the character of certain constituents of the total radiation of the flame, raising or lowering them to the condition associated with maximum luminosity. Another example, but of a different

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order, is afforded by the phenomena of electrolysis. The electric current is passed between two conductors through a fused metallic salt or its aqueous solution. The two constituents of the salt, metal and acid, are separated and appear each at its respective pole or conductor. This may be regarded in general terms as a communication of energy to a compound body, and the appreciation of the energy lands the constituents of the compound into the emancipated condition of elementary or dissociated molecules.

So much briefly and superficially concerning the main function of the photo-sensitive substance.

And what of the medium? The media actually used in practical photography are not many. They have one feature in common: they belong to the group of colloids. The term applies to a diversified group of compounds containing representatives of all the more prominent chemical types: bases, acids, salts, alcohols, esters, etc.

It distinguishes a common property of such compounds in solution, viz., that of forming, when dissolved, gelatinous or viscous liquids, as opposed to the limpid or mobile solutions of the compounds known as crystalloids. The group of phenomena summed up in these two antithetical terms were exhaustively investigated in certain directions by Graham, many years ago. But in recent years they have been more profoundly studied, and have in fact become one of the most prominent arenas of pioneer work in molecular physics. It is of course in the order of things that the problems of physical science should become more and more refined. The chemistry of a generation ago revelled in discoveries which were striking enough to excite the crudest intellects. Thus the enrichment of the world by the introduction of the coal tar colors and the colossal industry which has been built up on this foundation, offers broader features of interest which excite wonder and interest from whichever point of view regarded. We doubt whether the current and future developments of chemical science will prove attractive in the same sense.

Of the problems of more general import now engaging the active work of investigators we may cite the following as having a direct connection with our subject *the theory of solution*, the mechanism of the process, and the actual molecular condition of substances in solution. More broadly the actual configuration of molecules in the various states of aggregation of matter, and the connection of physical properties with the order of configuration.

The *theory of assimilation* in the plant world. How radiant energy is brought in the plant cell to act upon such unpromising materials as carbonic acid and water and mould them into starch, cellulose, etc. The *theory of photographic action* in the narrower sense: what is the actual meaning of the "invisible image" produced by the impact of light on the prepared plate.

The connection of these groups of phenomena with one another may not be obvious and it would take us too far afield to demonstrate their intimate relationships to those who have not as yet given any thought to the subject. It is sufficient for our present purpose to remind photographers that they are moving in very good company as regards the science of their art. We may go further in stating that the science of photography is intimately bound up with coming developments of the greatest moment.

It is important, therefore, that its working basis should be broadened as much as possible and to include all substances or materials calculated to contribute. We cannot help thinking that cellulose is destined to play a more important part than heretofore, if not in the art, at least in its scientific developments.

This is our preliminary answer in general terms to the question "what has cellulose to do with photography?" We shall now demonstrate the more important properties of the substance in the hope of suggesting a few subjects for investigation and practical inquiry, which in the hands of experts should lead to results.

The external or mechanical properties of cellulose are remarkable, and there can be no better demonstration of the wide range of variations of aggregation and structure which are conditioned by these properties than an exhibition of specimens of cellulose in its most characteristic forms, natural and artificial.

Here we have of the former group, the fibres, cotton, rhea, calotropis; side by side we will place the new artificial silk or "lustra cellulose," which has recently been the subject of much writing, *ad captandum populum*, in the daily press. Far be it from us to endeavor to invade the "precious" incredulity with which many will meet the statement that this "silk" is identically the same in substance as cotton. As a matter perhaps of unpleasant duty, we have to point out that its brilliant lustre is due merely to the fact that it a solid cylinder of smooth and regular outline, whereas the cotton fibre is a flattened tube with membraneous walls. The form of the "silk" favors regular and maximum reflection of light that of the cotton favors the scattering and breaking up of the incident light.

Here we have a coarser thread, also prepared in continuous length by squirting a viscous solution of cellulose into a liquid which precipitates or solidifies it. This thread is carbonized for making the filaments of the electric incandescent light, the resulting carbon having great compactness or density. Here again we we have the cellulose in the form of artificially prepared films, which are transparent and of great tensile strength. Again we have the cellulose in masses of a firm resistant jelly, a form in which it separates, combined with water from certain aqueous solutions to be afterwards described. In this form it has considerable elasticity, approximating in the mass to that of indiarubber, though without the exceptional texture of the hydrocarbon. This hydrate parts with its water with extreme slowness, and the cellulose molecules in aggregating together constitute a solid of extraordinary hardness and taking an extremely high polish.

These solids are so dense in texture that they are hardly amenable to wood-turning machinery, and the usual comment which is passed on a casual inspection is that they must have been submitted to an enormous pressure. As we have seen, on the other hand, the only factor involved is the extraordinary cohesion of the cellulose molecules or particles. Of course in the natural world cellulose and cellulose compounds which constitute the entire framework of the vegetable world, present themselves in an imposing array of structural forms from the tenderest silky mycelium of a fungus to the densest of woods such as lignum vitæ. But in these natural forms there are

considerable variations of chemical composition which somewhat invalidate comparisons. We have, therefore, chosen the various forms of the pure substance, natural and artificial, as an object lesson of the great diversity of structural form which one and the same substance may assume. But we have now to deal with the more interesting question of the chemistry of this substance. So far we have remained in the region of sense-impressions; the province of the chemist is in the sub-sensible region, which can only be entered through the channels of the imagination. At the same time the results of the chemist can be very well appreciated apart from a close study of their theoretical basis, and we must endeavor to give a brief chemical history of cellulose from this more limited practical point of view.

Cellulose is, for a compound of carbon, hydrogen and oxygen, a body of remarkable inertness. It entirely resists a number of very severe treatments, more especially is able to withstand the action of alkalies at high temperature. It is difficult of attack by oxidizing agents. The industrial value of cellulose and its unique position and functions in the vegetable world are largely due to these negative characteristics. If we compare cellulose with the well known substance starch, to which it is in many respects nearly related, we find that both are aggregates of sugar or glucose groups.

Starch on the one hand is soluble in water and easily broken down in solution by certain ferments, to the simple sugars, of which it may be regarded as compounded. Cellulose is insoluble in water, and can only be resolved into sugars by the action of powerful reagants such as sulphuric acid.

In its original fibrous and insoluble form, cellulose is therefore a very unattractive substance. It is useful to the photographer in the various forms of paper which are employed in the art, but in these uses the negative characteristics of the substance are to the fore, and we shall therefore pass them by.

Special interest, however, attaches to cellulose when it is obtained in solution. There are three groups of treatments for obtaining such solutions.

(1) There are certain compounds of the metals which in aqueous solution dissolve cellulose directly:—

(*a*) Zinc chloride. When warmed with a 40 per cent. solution of this salt, cellulose swells up to a gelatinous mass, and finally dissolves to a homogeneous viscous solution. The cellulose is reprecipitated in flocculent masses on dilution with water, the precipitate retaining a large proportion of zinc oxide approximately in the proportion $_8C_6H_{10}O_5.ZnO$.

By alcohol the compound is precipitated in a tenacious homogeneous form, *i.e.*, in films or threads, according to the method of bringing the liquids together.

We have often wondered why photographers have made no use of this solution. It certainly lends itself to the manipulations with which the craft is familiar, and appears to offer a method of preparing a suitable medium for carrying the photo-sensitive substance, whether on glass or paper. Certainly it should be found useful in investigations, and we commend the preparation to notice as affording a plastic modification of cellulose; one, moreover, which is easily obtained.

(*b*) Zinc chloride dissolved in hydrochloric acid.

A solution of the salt in twice its weight of the aqueous acid acts instantaneously on cellulose in the cold, and for many uses in research work has, therefore, important advantages over the preceding solvents.

Photographers may make some interesting demonstrations with this solution. If a platinum print be laid face downwards upon a resistant surface, *e.g.* glass, porcelain, or asbestos, and the reagent poured upon the paper, the solution of the paper is accompanied by the appearance of the photograph in full detail. The effects are interesting, and as every chemical effect finds a practical application somewhere or other, we quite expect to see this solvent taken advantage of.

We have now described two solvents of cellulose, one a normal salt, a compound of a metallic oxide, and an acid in equivalent proportions; and one an acid solution of this salt. We have now to describe an alkaline solvent, a compound of a metallic oxide which may be regarded as having acid properties, with the alkali ammonia.

(*c*) Solutions of cuprammonium are prepared by adding precipitated copper oxide to strong aqueous ammonia. Crystallized copper sulphate is dissolved in water and to the cold solution, caustic soda (solution) is added. The blue gelatinous precipitate of copper oxide (hydrated) is well washed on a cloth filter, squeezed and pressed and stirred into strong aqueous ammonia.*

The solution should contain the reagent in the proportion: NH_3, 10–15 per cent. C_4O, 25–30 per cent.

The solution may be also prepared by placing scrap copper in contact with very strong ammonia and in presence of air. The metal is oxidized by the oxygen of the air, and the oxide dissolved by the ammonia.

This solution rapidly attacks cellulose in the cold and forms usually gelatinous or ropy liquids. The reaction has been largely used in the arts for treating cloth and paper, the treatment with the solvent followed by evaporation of the solvent on the fabric leaves the surface in a condition impervious to moisture. As far as we know there have been no applications of this solution or the reaction in photography. But we see certain possibilities of results; and we have therefore included it in our list of cellulose products.

These three solvents constitute a group: their action depends upon reactions of a not very definite order speaking chemically. They may be broadly described as an interaction of acid and basic groups of the cellulose itself, reciprocally with basic and acid groups of the respective solvents: there results therefore a change to a species of soluble double salt.

We cannot here discuss the theoretical bearing of the reactions, and we must refer those who wish to follow them up, to the special literature of the subject.

We now pass to methods of dissolving cellulose which depend upon well-defined reactions in which the cellulose is converted into derivatives or compounds belonging to well-known groups. These reactions are reactions of synthesis, and take place with those groups of the cellulose molecule the presence of which makes it an alcohol. The reactions of cellulose are, in fact, exclusively those which belong to the group of alcohols. Thus, if we write ordinary alcohol, the arch-fiend of the "blue-ribbon" philosophers, as $C_2H_5.OH$ we may write cellulose for the purpose of this discussion as $C_6H_9O.(OH)_4$. It is the OH groups which are alcoholic.

* See also *Ber. Deutsch. Chem. Ges.*, 13, 1822.

We shall now describe one of the most characteristic of such compounds cellulose which occupies an intermediate position between the ill-defined componnds above described, and a group to be subsequently dealt with in conclusion, It is a compound soluble in water in all proportions, whereas in the latter group, that of the acid ethers of cellulose, the relationship to water become negative: they are eminently water-resisting compounds. In respect of this property, therefore, the transition is maintained. Cellulose is attacked by solution of the caustic alkalies at a certain degree of concentration, *e.g.*, at and above a strength represented by 12 per cent., Na_2O on the solution · the effect on the fibrous celluloses is remarkable. They swell up, shrinking considerably in length and become translucent or transparent. The effects are due to the definite combination of the cellulose and alkali in the proportion: $C_6H_{10}O_5 : Na_2O$, We may express the compound "alkali cellulose" in the abbreviated form, $X \begin{matrix} ONa \\ ONa \end{matrix}$. This compound in the presence of water reacts with carbon bisulphide in the cold. The molecules unite thus, $X \begin{matrix} ONa \\ ONa \end{matrix} + CS_2$: the resulting sulpho-carbonate of cellulose may be written as $CS \begin{matrix} OX. \ ONa. \\ SNa \end{matrix}$ The compound is perfectly soluble in water and the solution is now employed on a large scale in several industries, being known as "Viscose." Its most important property is that of decomposing spontaneously on keeping, the cellulose being regenerated in compact coherent masses. The decomposition is more rapid at high temperatures.

Obtained as described, the solution has a yellow color due to by-products of the reaction. The pure compound is obtained by treating the crude solution with a saturated solution of common salt or with alcohol. Both reagents precipitate the pure cellulose sulpho-carbonate. If the liquids are poured into the viscose the compound is precipitated in flocculent masses; but if the viscose be spread upon a glass plate and the whole submerged beneath the precipitating solution, the compound is obtained as a coherent film of a greenish color.

We do not propose on this occasion to do more than demonstrate the main properties of the solution and of the new forms of structureless cellulose to which it gives rise.

We pass on to the third group of soluble and plastic compounds of cellulose, those formed by the reaction of the OH groups of cellulose with negative or acid and radicals; these are the acid ethers or esters.

Of the possible esters of celltose, the following have been investigated: the nitrates, acetates, benzoates and sulphates.

Whereas, however, the first named take a prominent place in the industrial world, the three latter are known only to specialists. We need only briefly remind our audience of the chief uses of the nitrate of cellulose. They are two, and in strong contrast to one another. The higher nitrates of cellulose are the basis of the modern high explosives, the so-called smokeless powders and the like; the lower are employed as the basis of the many forms of transparent and opaque films employed in photography, of celluloid, zylonite, and other plastic materials of this group, also of the well-known collodion which played so important a part in the early days of photography, and still more recently as the basis of the new "artificial silk" industry. Avoiding the details of their applications, we may say a few words on the more important chemical features of these products.

Cellulose combines with nitric acid in several proportions. Writing the compound as $C_6H_7O_2 . (OH)_3$, each of the OH groups may be made to react with HNO_3, or nitric acid, each OH becoming in succession O. NO_2 with a corresponding increase of weight of the resulting nitrate. What we wish to point out is that with the entrance of these highly negative or acid groups the physical properties of the parent molecule are not profoundly modified. The products are soluble in various liquids, *e.g.*, ether-alcohol, nitro-benzene, nitro-glycerine, which are without action on cellulose, but the properties of the compounds in solution are very much those of cellulose itself as seen in the solutions previously described. This could not be better illustrated than in the processes of spinning and preparing the "artificial silk." What is actually spun or drawn is a viscous collodion, the ether-alcohol solution of the intermediate nitrate. The resulting thread after elimination of the solvent is therefere the explosive compound or nitrate. But the nitric groups are easily removed by a chemical treatment. The yarn is treated with ammonium sulphide for this purpose, and there finally results a thread of pure cellulose, with very slight attendant change of physical properties. (See *J. Soc. Chem. Ind.*, June, 1896.) The cellulose is therefore taken through a cycle of chemical treatments without sensible change in properties, in order to take advantage (while in the intermediate stage of nitrate and in this form soluble in suitable solvents) of the plastic and structural properties which are evidently those of the parent molecule.

The acetates stand next to the nitrates in order of technical interest. They are not easily prepared from the fibrous celluloses, but are obtained by simple reactions from the cellulose regenerated from solutions as sulpho-carbonates. These reactions are described in a paper which we communicated to the Chemical Society in 1895. (See *Journal*, p. 433.) The acetates are in physical properties similar to the nitrates. They are, however, non-explosive and withstand high temperatures, melting above 200 deg. C to a clear liquid. They are in fact, as might be expected, extremely stable compounds, and in many respects, therefore, they are superior to the nitrates for industrial uses. We are taking steps to have them manufactured on the industrial scale, and hope very soon to be able to offer them to photographers.

It would be interesting, if only on theoretical grounds, to make comparative trials of the well known but now relatively obsolete, collodion processes, with the acetates used in place of the nitrates. If any expert minded to undertake such investigations will communicate with us, we shall be able to put him in the way of obtaining supplies of the material. We shall not discuss the probable uses of these hew products in detail, but content ourselves with a demonstration of their properties, and leave the matter in the hands of the specialists.

The benzoates again are compounds easily prepared from the more reactive celluloses obtained from the sulphocarbonate solutions. They have been even less investigated than the acetates. They have the same general properties, and will no doubt in due course find their application.

These compounds will be found more fully described in our book on *Cellulose* (Longmans, 1895). On this occasion we have merely to bring them together in a certain connection, *i.e.*, with the view of making photographers acquainted with the possible useful forms of cellulose and its compounds. The annexed table sums up the results of this discussion, and gives a bird's eye view of these various products regarded from the present practical point of view, as methods of bringing cellulose into solution.

Soluble Compounds of Cellulose.

A. By direct treatment with solvents: the cellulose in solution as a species of double salt; the solutions are aqueous.

1. Neutral. Zinc chloride.
2. Acid. Zinc chloride in hydrochloric acid.
3. Basic. Cuprammonium compounds.

B. Compounds previously prepared by synthetical reactions with alcohol OH groups.

1. Sodium hydrate and carbon bisulphide. Synthesis of sulphocarbonate in two stages. Solutions aqueous, and of course alkaline.
2. Acid esters of cellulose: compounds of "neutral" properties.

Nitrates. Acetates. Benzoates.

Soluble in: ether, alcohol, acetone, chloroform, glacial acetic acid, etc.

We now return for a few moments, in conclusion, to general considerations.

Cellulose as the colloid medium for the photo-sensitive substance has of late years given place largely to its rival gelatin. Gelatin is a substance differing radically in composition and constitution from cellulose: having however a fairly close resemblance to cellulose in physical properties, more especially in aqueous solution.

If we are to have positive knowledge of the actual function of the "medium" in the photographic system, it must be made the subject of definite scientific investigation. An important aid to investigation is the power to vary at will the several factors of a result. In cellulose, which includes, we may say, a number of natural products of different constitutions and in the groups of derivatives which may be formed from it, we have a substance which may be studied under a range of suitable variations. The purpose of this demonstration has been to suggest methods of manipulating various forms of the substance, the details of which will readily occur to those familiar with the technicalities of the art. Those who have not followed us from this point of view will, we hope, at least have got some fresh insight into a very attractive province of the chemistry of nature's raw materials.

Platinotype Prints.—Once this fascinating process is taken up it will not be long before some negatives are found, which, being somewhat strong in contrast, require the printing to be carried on for such a length of time that the shadows are perfectly bronzed, and when development takes place they refuse to come up in the deep shadows anything but a deep brownish color, being much as if they had rusted like old scrap iron. It may so happen that the general appearance of the print as a whole does not materially suffer when looked at straight in front, but on viewing it from one side the defect is generally strongly evident. The remedy is very simple, and both easily and quickly applied, nothing more indeed than brushing over the parts solarized, a wash of wax water maglip, a bottle of which may be obtained of most artists' dealers. It is used in water-color painting to add force to deep shadows, and the improvement it brings about on a faulty platinotype print is very marked; the dingy rusty color will instantly depart, and the shadows lose their bronzed appearance.—*The Amateur Photographer* (English)

CHEMICALS THAT DETERIORATE.

BY C. F. TOWNSEND, F. C. S.

Purity from a chemical point of view is merely a question of degree. In all probability nothing has ever been obtained absolutely pure, not even such a simple substance as water. Nevertheless, photographers may comfort themselves with the reflection that only very rarely is it necessary to have even a comparatively high state of purity in the chemicals they use; in most cases it is only necessary to guard against a particular impurity. One of the principal dangers, however, is that although a chemical substance may be of sufficient purity when it leaves the hands of the manufacturer, yet by the time it comes to be used the material may have deteriorated seriously through exposure to the air. It is convenient therefore to consider the subjects of purity and deterioration together.

The impurities present in commercial (*i. e.*, unrefined) sulphuric acid or oil of vitriol are lead sulphate, and miscellaneous dirt. As soon as the acid is diluted, the lead sulphate, which will dissolve in strong but not in weak sulphuric acid, is precipitated, causing turbidity. Sulphuric acid is so very cheap that it is not worth while to use any but the purest, and impurities need hardly be considered.

Hydrochloric acid is liable to contain iron, arsenic, and free chlorine. The purest acid only should be used and should be rejected if it contains the least yellow color which indicates the presence of iron. Arsenic is not a matter of any consequence for photographic purposes, and free chlorine is not of much importance and would not be easily detected by photographers. Muriatic acid or commercial hydrochloric acid, sometimes called "spirits of salt," always contains iron.

Nitric acid should be colorless, or nearly so; a reddish color shows either that the acid is of low quality, containing lower oxides of nitrogen or that it has been in stock for a long time.

Citric acid not infrequently contains lead, but the quantity is not large enough to interfere with photographic work, although it is a serious matter when making artificial lemonade

All acids, if left exposed to the air, absorb any ammonia that may be present and lose strength by evaporation, except sulphuric acid, which possesses a great attraction for moisture. If a dish half full of sulphuric acid be left exposed to the air the liquid will gradually rise until it overflows the vessel.

Ammonia seldom contains any impurity except carbonic acid, forming ammonium carbonate, or carbamate, to be more correct, but it is sometimes deficient in

strength. "Ammonia," like hydrochloric acid is a solution of a gas in water, so that *liquor ammonia* is not ammonia, strictly speaking, but ammonia dissolved in water (ammonium hydrate). When exposed to the air or heated the ammonia gas escapes from the liquid. The presence of carbonate can be distinguished by the white opalescence caused by the addition of the suspected ammonia to a solution of calcium chloride or other salt of lime; it is not an impurity that need trouble the photographer in the ordinary way.

Caustic potash and soda vary considerably in purity, carbonate being always present to a greater or less degree. In addition to this, silicates, lime, iron and other impurities are frequently contained in the solid hydrate. It is a good plan to allow the solution to stand after dissolving the solid, and to decant off into a funnel containing a plug of glass wool or asbestos. Caustic alkalies act on glass rather rapidly if in strong solution, dissolving out the silica, so that strong alkaline solutions always have a deposit at the bottom. On account of this action on the glass, alkaline solutions should never be stored in stoppered bottles, as the stoppers nearly always get immovable after a short time. Nearly everything that has been said about the caustic alkalies applies to their carbonates. Washing soda, the common hydrated crystalline form of sodium carbonate, effloresces in the air, *i. e.*, the crystals lose their water and break down into a white powder. The material is none the worse for this, except that solutions made from effloresced soda contain a great deal more alkali than if fresh crystals had been weighed out.

Thiosulphate of soda or "hypo," frequently contains impurities, but as a rule they do not interfere with its use for photographic purposes. The tendency of the material to become acid is the danger to be guarded against; a few drops of ammonia solution, or a little bicarbonate of soda, will neutralize the acid. The real danger is not in the acid itself, but in its action on the rest of the "hypo," as it sets free sulphur and sulphurous acid. The former causes stains and the latter has a strong bleaching action.

Sulphites and meta-bisulphites deteriorate rapidly if exposed to the air, being converted into sulphates. For this reason they should be kept in well-stoppered or corked bottles, and the smaller the air-space in the bottle the better. Solutions, especially diluted solutions, go wrong much more quickly than solids.

Care should be exercised in purchasing potassium or sodium cyanide to see that the material has not been in stock for a long time. The carbonic acid of the air turns out the prussic (hydrocyanic) acid rapidly, and it is not uncommon to meet with cyanide that is completely converted into carbonate, containing no cyanide whatever. The well-known uncertainty of cyanide intensifiers is rendered still more uncertain from this cause.

Sulphocyanide is very deliquescent, and it is well to make up, say, a ten per cent. solution of the whole of the salt as soon as purchased, otherwise the material becomes a sloppy mess.

Ferrous sulphate that is not quite fresh becomes oxidized more or less to the ferric salt, and it is important that the crystals be stored in well corked bottles. When making up a solution the crystals should be sorted, and any that show brown or yellowish tint should be thrown away. After the solution of ferrous sulphate is made up it is a good plan, unless it is all to be used immediately, to fill a number of small corked bottles with the solution. Some paraffin candle-ends should be melted up in an old gallipot, and the tops of the bottles dipped in the paraffin, which seals them effectually from the air. By this means the stock can be kept good indefinitely, whereas, if all be stored in a large bottle fresh air would be admitted every time the stopper is withdrawn, and the air space over the solution keeps getting larger and larger and the deterioration increasingly rapid.

Ferric chloride, as usually purchased, is distinctly acid, but this is an advantage for etching purposes, provided the acidity be not too great. With a little practice the eye can gauge the acidity of the solution fairly well from its color; brown indicates a neutral or slightly basic salt; yellow, an acid condition, and the solution or solid become brighter or more yellow as the acidity increases. The acidity is due to free hydrochloric acid. If no free acid be present the solution is apt to become turbid when dissolving the crystals, or to deposit a muddy basic sludge when etching. If too acid the etching is of too violent a nature, and the resist may leave the plate and the dots be under-cut in half-tone. Ammonia or other alkalies must not be used to correct this acidity, but a sludge of ferric hydrate is added, as described more fully in T. Bolas' recent article in *The Process Photogram* for June, 1897.

Ferric oxalate should be protected from the light, which reduces it to the ferrous salt, rendering it useless for making "blue" printing papers.

Silver salts are reduced by light and blackened, most of the photographic processes depending upon this reduction. It is a good plan to paste brown or black paper round bottles containing silver salts, whether in the solid form or in solution, and too keep them in a dark cupboard.

Developers of all kinds should be protected from the air as much as possible. It is inadvisable to make up stock solutions unless they are to be used up quickly. Sulphite added to the solutions confers a certain amount of permanency, as the sulphite is the first to be oxidized, thereby shielding the developer.

Last, but not least, a few words must be said about that very common and necessary reagent, water. Salts of lime and magnesia, iron, chlorides, ammonia, and other impurities are contained in most natural waters. Spring waters as a rule contain a large quantity of lime, especially in limestone or chalk districts. This can be partly removed by boiling, the carbonate of lime falling to the bottom, but the permanent hardness or sulphate of lime remains. Upland and river waters, and shallow well waters, contain ammonia, but not in sufficient quantity to trouble the photographer; chlorides are much more likely to be present than in spring water, but lime in only small amount. With silver salts chlorides give a white precipitate; in the washing of silver prints, previous to toning, the opalescence in the water is due to this cause. Near the sea the spring or surface water always contains large quantities of chlorides, due to the fine spray blown inland during storms. Surface water frequently contains peaty matter, which has a tendency to stain the prints a brownish tinge. Rain water contains the impurities, whatever they may be, that it has carried with it off the roof. All gross impurities may be re-

moved from water by distillation, and distilled water should be used for every purpose, *i. e.*, for dissolving salts of silver, lead, iron and other metallic salts, oxalates, caustic and carbonated alkalies, where a deposit is likely to be caused by the lime or chlorides in ordinary water. One last impurity in water must be mentioned, namely, air, or rather oxygen. The last-named gas dissolves comparatively readily in water, so that boiled water should be used in making up solutions of ferrous sulphate and other developers.

Gold chloride generally contains free hydrochloric acid, which should be neutralized by a little whitening or precipitated chalk. Commercial "gold-chloride" is a double chloride of gold and sodium or potassium. There is no objection to this, so long as each tube of chloride contains its guaranteed quantity of gold.—*The Photogram.*

SOME PRACTICAL POINTS.

BY W. THOMAS.

Shading Prints.—A piece of ground glass proves of great use when making prints from negatives possessing too marked contrasts to give harmonious results when printed in the usual manner. If a print be made on P. O. P. and fixed, we can form a good idea what further alteration it needs to make it what is desirable. If ground glass be laid on the print, ground side upwards, it will be found a simple matter to rub over those portions covering the fully printed parts underneath either powdered stumping chalk or blacklead. When this is done, another print may be done in the ordinary way, and when all but the densest parts of the negative has fully printed, then place over the frame the shaded ground glass and allow printing to continue (of course in diffused light). The result will be found a marked improvement. The small trouble necessary is more than repaid when print after print is taken, and the results turn out of the same good quality. Two or three small tin tacks should be fixed on the outside of frame so that the ground glass may be placed each time used in correct register. The negative being jammed up into the same corner of the frame as well, ensures each print receiving the further exposure in the correct parts only.

Process Plates.—For making transparencies from which afterwards enlarged negatives may be made, if a dry plate is used in preference to carbon tissue, it will under ordinary conditions be advisable to employ a plate of low sensitiveness, and recently, having some eight plates to make positives for use afterwards in enlarging, some of the photo-mechanical plates were used with every success. The latitude they give in exposure and subsequent development proves of the utmost use. When dealing with negatives which demand strong treatment, from exceptionally thin negatives, they give good rich transparencies without trouble, and for the purpose of reproducing a useful printing negative from one too thin to be of use they will be found admirable, the one feature they possess most marked being the ease with which density is given. Used for the purpose just suggested, they do away with the troublesome and not always successful process of intensification.

Cut-Out Mounts.—When framing prints up to 10 x or 12 x 10 size, it is useful to have by us several masks to try the effects of different shades or colors, with which to surround the finished print, all that is necessary being to take several pieces of brown paper of different shades, and cut out an opening, say 11 x 9 from the center for 12 x 10 prints, or 9 x 7 for 10 x 8 prints and so downwards according to the sized plates used required, then a few sheet of stout drawing paper may be washed over with cold and warm grays in different strengths. Ordinary water-color prints will provide any variety of tint, and a dozen masks may quickly be made without the least difficulty by anyone, and prove most useful to have at hand when the question of a suitable colored mount comes to be considered to finish off exhibition work, or indeed any intended for framing.

Lantern Binding.—The worry and bother of so small a matter as sticking together the two small bits of glass which constitute the ordinary lantern slide, can hardly be imagined unless tried for the first time. With a little practice it becomes quite simple, but if only occasional slides are to be fixed up, the slight increase in cost entailed is more than made up by using the cover glass sold by various makers, to which is already affixed the binding strip ready glued, and all that is needed being to place the slide and mask in position, moisten the gum, press the whole together, and the thing is done, without either loss of temper being suffered, or waste of time, which may be well put to better use than struggling with a strip of paper, supposed to stick wherever it touches, but which in practice, at any rate with many, begins by the supposition and ends there. One trifling matter being that it is better to moisten gummed paper a few moments before pressing it down to its final resting place, with any of the gums or mounting pastes sold for the purpose of mounting prints; it makes sure doubly sure.

Blue Spots.—Many pleasing effects may be obtained with either bromide or platinotype paper by means of toning them with uranium, but the utmost care is called for in preparing them, to see that in either case the various salts or metals are thoroughly got rid of. A trace of hypo left in the print will cause unpleasant stains to quickly appear, the only redeeming features of which will be the speedy manner they will show themselves in, generally within a few moments after applying the toning solution. This allows the print being destroyed, and spares the mortification of a wretchedly marked result being alive in the world to the mortification of its producer. Not so, however, would it appear when, instead of hypo, iron has to be taken into account, as in platinotype. This metal would appear to be more difficult to eradicate from a print than even than even that old foe hypo, and when traces are present in a print afterwards to be treated with uranium, the dangers are more troublesome, for the evil results may not show themselves for some little time after, but when they do blossom forth, there is no mistaking the result, which takes the form of blue spots on a red print. A wise practice to follow when using this form of toning on platinotype prints is to keep them in your possession

for a few weeks to see if any such undesirable change is likely to make itself evident. If after that period of time they still remain as made, not much trouble from blue spots need be feared.

Washing Large Prints.—Considerable saving in time is effected if instead of simply transferring the print or prints direct from the hypo bath to the washing dish, they are taken and simply laid on a sheet of glass and a good flood of water allowed to play over them from the tap, turning each side in turn, and either running a roller squeegee pretty firmly over them or pressing the palm of the hand over in all directions. This rids the paper of a considerable quantity of the hypo, and seven or eight doses of this treatment with soakings in clean water between each squeegeeing, will be found ample, even with such stout paper as rough Whatman's, and becomes a matter of some little importance if cramped for room or pushed for time to finish off a large print or two.

Mounting Large Silver Prints.—The less a silver print is brought into contact with its support by means of some mountant or other the better, and when handling the larger-sized prints intended to be framed close up, it is advantageous to simply very slightly damp the print and mount it with, say, half an inch glued all round. When dried, the paper will be found to have contracted and the print lie perfectly flat, and should any mischief result afterwards from any cause attached to the mountant employed it will only show itself round the narrow rim where the glue or paste had been applied. Another method being to glue the face of a print on to the glass straight away by about a quarter of an inch or so as before all round the edges, and having damped the paper as before, it will contract in drying and show firmly and evenly stretched when dry.

Strong Contrasts.—These may be considerably reduced by giving a full exposure and developing with a rodinal solution added to which is three or four times its bulk of water. This not only slows down its action, but enables one to get out detail and prevent any serious blocking up of high lights. If the variation between high light and deepest shadow should be considerable, and exposure may not be possible for a sufficient lengthy time to ensure full and ample action of light taking effect, a very small trace of soda or potash will aid matters considerably, but only a very small addition is allowable, beyond which fog of a bad order inevitably follows.

Tinting Down.—It proves useful when a print has patches which need to be shaded down after being fully printed in the usual manner, to place it in a larger size printing frame behind plain glass, and also alongside a small bit of P.O.P., then one is able to judge far better the effect the light is having by watching the small piece of silver paper as it gradually is tinted, and when done about as far as we need, the platinotype print shaded, the matter is ended.—*The Amateur Photographer*, (British).

Chemical Blackening of Aluminium.—It is stated in *La Photographie Francaise* that aluminium may be blackened by being first thoroughly cleaned, and then coated with fresh egg albumen, and gently heated, and the temperature gradually raised. After some time, a deep black is obtained, which will withstand acids, and can only be removed by repolishing. The process has the advantage that the metal is not attacked.—*British Journal of Photography*.

Hypo in Metol Developers.—Acerding to Dr. Eder, the addition of a small quantity of hypo to the metol developer gives great brilliancy and pluck to the negatives; it seems to act as a restrainer and prevent fog. The particular formula he suggests is:

A.

Water	1000 parts
Metol	15 parts
Sodium sulphite	150 parts

B

Water	1000 parts
Sodium carbonate	150 parts
Hyposulphite of soda	1 part

For studio work he suggests the use of 40 parts of A, 20 parts of B, and 20 parts of water; for landscapes, 20 parts of A, to parts of B, and 20 parts of water.—*British Journal of Photography*.

The Brilliant Developer.—This new developer surpasses all others in covering power and cheapness, it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted. With equal exposures and equal time of development it will give as an average three times more covering than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of carbonate of potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with pyro, ferro oxalate, hydroquinone, metol, eikonogen, amidol, etc., it has been ascertained that, in using the Brilliant developer, as an average only one-third of the time of exposure is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage, especially during dull weather. Thus much money, time, and work can be saved on plates, which otherwise would have been lost by under exposure or the object having moved.

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant developer

The success this new developer is having in Europe is simply marvelous especially with professional photographers, who are, as a rule, so reluctant to try new materials. It has obtained a prize at the Berlin Exhibition for Photography. The Scovill & Adams Company of New York, are the agents for this country.

NOTES.

The price of Silver Nitrate is unprecedentedly low.

Mr. H. Snowden Ward, one of the editors of "The Photogram," will shortly pay a visit to this country.

Have you seen "Sunlight and Shadow," the new illustrated book by W. I. Lincoln Adams? It's fine!

The Annual for 1898 will be the finest photographic volumn ever published anywhere—on earth.

An Electro-Photographic Recorder has been invented for timing and photographing the start and finish of a race.

A New Edition, the Sixth, of "The Photographic Instructor," has been demanded, bringing the sale of this popular hand-book up to *eight thousand.*

Have you secured your Goerz lenz yet? It is the latest and the best. The Scovill & Adams Company are sole American trade agents.

The Annual for 1898 will be out soon. It contains no less than 300 illustrations illustrating the works of the leading photographers from all parts of the world.

Ralph J. Golsen, of 146 State street, Chicago, sends us his latest bargain list. It is crammed full of good things and should be in the hands of every photographer.

W. A. Fraser, of N. Y., was awarded a silver medal for his lantern slide exhibit at the Glasgow International Exhibition and Mr. Archibald, of Newark, N. J., a bronze one.

Songs and Stories, the title of the second volume, is fairly descriptive of its contents. Songs have been carefully chosen from writers whose works are landmarks of literature, or who have seemed to comprehend fully what interests the child-mind.

Oil Paintings on Photographs. — A well-known writer recommends for the making of paintings over photographs that a blue print be made, washed and dried. If this is painted and then immersed in a two per cent. aqueous potash solution, the blue picture will disappear, leaving only the painting.

The End of Art.—Art may be *made* to serve many ends, but its true end is to afford pleasure For this end it must not only render Nature truthfully, but with greatest amount of pleasure-giving truth. Hence indiscriminate reproduction of Nature's ever-varying phases is impossible in art. The artist shows his genius quite as much in the selection as in the execution of his work.

Scribner's Magazine for November contains two articles of interest to photographers. One on aerial photography detailing the attempts that have been made to photograph from balloons and kites, and the other on night photography, illustrated with pictures made at night by Alfred Stieglitz and W. A. Fraser.

Mr. F. H. Worsley-Benison, of Chepstow, England, contributes an interesting article on Seascape Photography to the 1898 Annual, illustrated with specimens of his work. Mr. Worsley-Benison has made a special study of this branch of photography, and has successfully portrayed the sea in all its varying moods. We advise our readers to send for his list of pictures. His carbon enlargements are superb.

The stock, fixtures and good will of the J. C. Somerville Photo. Supply Co., of St. Louis, has been transferred to Mr. H. A. Hyatt, of the same city. Mr. Somerville will remain with Mr. H. A. Hyatt some time to see that all orders are filled in the usual manner. The business will hereafter be located at 410 and 412 North Broadway, where we shall be pleased to receive our friends. The transfer embraces the printing and embossing plant of the above Company.

Toning Blue Prints.—According to Bolle, ferro-prussiate prints may be toned to a lilac color by immersion in hot or cold solution of acetate of lead (the liquor plumbi subacetatis of the chemist), potassium sulphocyanide solution, thirty-five per cent.; with the addition of a few drops of acetate of lead solution a violet black color is obtained. A four per cent. solution of potassium oxalate may be used for writing on such prints, and gives white letters, or, if the print has been drawn on with Indian ink, the blue image may be entirely bleached by this.

Fairy Life, third volume, is an appeal to the imagination of the child. The fairy world to the child, is a real world, and the attempt to enter into life of the fairies is intended to gratify the natural curiosity which children feel to know more about the little people who are so real in them. Illusion in childhood is pleasurable and harmless, and does not foster untruth. It is as cruel to destroy the fairy world for the child as it is to take away Santa Claus from among his benefactors.

Mr. H. P. Robinson, whose autobiographical sketches are appearing in this magazine, writes to a contemporary: My younger son, who is spending his holiday on the Broads with his wife, was running before a storm in the dingy of his yacht, when something went wrong with the sail sheet and they were blown over and went to the bottom. It fortunately happened he is a fine swimmer and four or five years ago took the silver medal and certificate of the Royal Humane Society, so he knew what to do, and swam to the bank with his wife. He then returned and dived for his boat and saved everything but his pipe.

To facilitate the study of X-Rays, A. Imbert and H. Bertin-Sans had a special kind of "photometer" constructed by MM. Ducretet and Lejeune, which consists essentially of a fluorescent screen over which is laid a course grating of lead wires and a prism of aluminum. When the X-rays examined are feeble, they are only able to penetrate the thin end of the prism, and no shadows of lead wires are visible on the screen except under the thin end. This happens when the vacuum tube is exhausted just enough to give X-rays. As exhaustion proceeds more lead wires become visible, and when the tube is on the point of becoming non-conducting the illumination over the whole of the screen is uniform, and the shadows stand out with equal sharpness. At this stage, indeed, aluminum becomes perfectly transparent to the rays, and so do the bones of the hand. This type of rays is particularly well suited for the radiography of the deeper seated anatomy.—*Comptes Rendus.*

Ballads and Tales, the fourth volume, takes a step from the purely imaginative to the imaginative mingled with the real. The heroes of history or the half-mythical personages of legend or romance are now introduced to the opening intelligence.

Hence we find that Arthur, Galahad, Richard Cœur de Lion, William Tell, Macbeth, Robin Hood are all brought to the attention either in song or story.

The book forms a fitting introduction to history, and gives an informing and cultivating acquaintance with many of the figures whose adventures form so large a part of what is most enjoyable in our literature.

The books are tastefully printed and bound, and the price is so low that they are within the means of schools possessing only the slenderest resources. Though the covers are in dainty colors, they will bear considerable handling without soiling.

These are the only supplementary readers we know of which have been edited to correspond with what are called the "Culture Epochs" in a child's development.

Golden-Rod Books.—Rhymes and Fables (*First Grade*), 64 pp.; Songs and Stories (*Second Grade*), 96 pp.; Fairy Life (*Third Grade*), 126 pp.; Ballads and Tales (*Fourth Grade*), 160 pp. Compiled and adapted by John H. Haaren, A. M. New York: University Publishing Company.

The four little volumes known as the "Golden Rod Books" are designed to produce attractive reading supplementary to the first four books of any series of readers. The selections are so arranged as to appeal to what interests the child at successive periods of mental development. Hence there have been introduced many children's classics—pithy proverbs and apt sayings that impress the memory—the rhymes which have been the cherished lore of the nursery for generations, and fables are chosen which are the common heritage of the Aryan people.

To Give Greater Depth to Platinotype Pictures.—As is well known, the full details visible in the shadows of a damp platinotype print disappear in the dry print, leaving behind a gray and flat or even a sooty appearance. In order to correct this fault, the surface must in some way be made a little more matt, or rather the reduced platino must be imbedded in some kind of varnish medium. A well-made varnish will scarcely glaze the picture and yet will make a perceptible difference in the depth. Wightman recommends the following varnish:

White wax	1 drachms
Elemi	7 drachms
Benzol	8 drachms
Alcohol	2 ounces
Oil of spike	10 grains

The dry chemicals are placed in a wide-necked bottle the alcohol is poured in, and the dissolving is done by slow and careful warming. This is best done in a water bath. When all is dissolved, the benzol is added (of course not near a light), and the whole allowed to cool while being continually stirred. When it is cold, the oil is finally added, thus forming a sort of paste, which can be stored in porcelain jars. To use this paste, a little must be taken a pad of cotton, and rubbed with a circular motion on to the print, which is then rubbed with a second pad of cotton until all superfluous paste is removed, when it will be found that the platinotype has become strong and rich in details.—*Photographische Chronik.*

Mr. F. H. Wright writes to the *English Mechanic*: "Why do not professional landscape photographers make it a rule to mark on each plate the exact direction of view? I was examining a number of Continental photographs recently, and, while there is, doubtless, a large percentage of persons to whom a photograph of some town, building, lake, or harbor, is simply that and nothing more, there are many others of a more observant nature, to whom the value of such pictures would be greatly enhanced if they were sure of their position. In a few cases the time given by some clock, which, fortunately, has been included in the photograph, considered in connection with the shadows, gives one an idea of the points of the compass; but I do not think it should altogether be left to hap-hazard."

Photographs of Sculpture in America.—In connection with its Exhibition in 1898, the National Sculpture Society proposes to form and display a comprehensive collection of photographs and other illustrations of sculpture and sculptured monuments in America.

The scope of this collection will include commemorative monuments, memorials, statues, groups, reliefs, busts, original works in museums, and architectural monuments adorned with sculpture.

The Society earnestly solicits the active co-operation

of individuals and organizations in making this collection, the first of its kind to be proposed in this country, as complete and as interesting as possible.

It is especially requested that the recipients of this circular communicate with the Secretary of the National Sculpture Society, Mr. Barr Ferree, 112 Wall street, New York, with regards to works of sculpture within their knowledge suitable for inclusion in proposed collection. Information is particularly requested as to the location of works of sculpture, names of sculptors, destination or use of same in connection with works of architecture, together with some estimation of their historic or artistic value. Information is also desired as to photographs of the works mentioned.

The society will gladly welcome photographs of works of sculpture for this collection, either as gifts or as loans. It is desired that photographs contributed for this purpose shall remain in the possession of the Society to be deposited in its rooms, and to form a permanent and historical memorial of sculpture in America.

Cutting Glass with a Diamond—Substitute for the Diamond.—The beginner who handles a diamond often fails because he uses too much pressure, but the main difficulty is to find the best cutting angle, and then to maintain this angle throughout the length of the cut; this latter involving a wrist action something like that by which a violinist maintains the same set of the bow across the string in the case of a long sustained note. In commencing to work with a strange diamond, the usual way is to begin with the handle as low down as the bevelled block will allow, and in the course of the first inch of cut to bring the shaft of the diamond more nearly perpendicular. As soon as the slight hissing sound of the true cut is heard the same angle and pressure must be kept up to the end. The bevel on the block must not be taken as an exact indication of the best angle for cutting, especially as a diamond will after long use often require to be held more obliquely than when new. It must be remembered that in the case of an ideally fine cut no glass whatever is removed, the pressure from the hard edge of the crystal causing the glass to rift or crack; but some diamonds produce what is called a rough cut, or a cut combined with a scratch. The wheel glass cutter forms a very poor substitute for a diamond in the case of thin glass, as so much pressure is generally required as to involve risk of breaking the glass; but for thick glass the wheel cutter may be even better than most diamonds. If the edge of a good three-cornered file is carefully ground upon an oil-stone to an edge formed by the meeting of two curved faces, a skilled worker can cut glass with the file as well as with a diamond but it will be necessary to slightly oil-stone the edge after each cut. The mere scratching of glass with the broken end of a file as a means of making it break in the required direction is quite uncertain and unsatisfactory, but on a broken flint one may often find edges formed by the meeting of curved surfaces which will cut well, but such edges wear down very quickly; each only giving a few cuts.—*The Amateur Photographer* (British).

Ferric Sulphate as an Etching Agent for Metal.—When a solution of ferric sulphate in water is allowed to act on some metals the sulphate of the metal with ferrous sulphate is formed, and there is more or less energetic etching.

This decomposition is expressed by the formula—

$$R + Fe_2(SO_4)_3 = RSO_4 + 2FeSO_4,$$

and there is no evolution of gas, and with the zinc and copper plates, as used for relief-printing plates, no substance insoluble in water is formed, which is the reason why, when ferric sulphate is used for etching, such clean, blank, etched surfaces are given. This is not the case when ferric chloride is used for copper etching, as the very slightly soluble cuprous chloride is formed, according to the equation—

$$Fe_2Cl_6 + 2Cu = Cu_2Cl_2 + 2FeCl_2,$$

and this cuprous chloride has to be removed with a brush. That the continuous formation of the insoluble cuprous chloride is prejudicial to the even action of the etching fluid is obvious, and ferric sulphate might well replace the chloride, only it is uncommonly slow in its action.

Experiments have proved that the results obtained with ferric sulphate are very beautiful, but I have not succeeded in obtaining a considerable hastening of the etching process by alteration of the concentration of the etching fluid, and the etching of a half-tone block on copper with a twenty to thirty per cent solution of ferric sulphate took over an hour.

This slow action does not make it very useful in practice, but it is of value when copper plates have to be etched blank. In practice it is customary to clean the burnt-in enameline copper plates with very dilute potassium-cyanide solution, in order to retouch it better or to stop out. Potassium cyanide is not only very poisonous, but it attacks also the finest dots of the enamel image if it is allowed to act too long. With a solution of ferric sulphate a clean blank metal surface is quickly obtained without any of the disadvantages of the use of cyanide.

Experiments are in hand as to the applicability of this agent for zinc etching, and a further report will be made —E. Valenta, in *British Journal of Photography*.

PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF OCTOBER, 1897.

(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

590,636. Attachment for Photographers' Tripods. A. F. Walter, Chatsworth, Ill.

A suitable bed is provided with a screw collar attached to the underside thereof, which is engaged by an upwardly extended screw shank of a spherical head or ball. A pair of plates are adjacently arranged with an open space between them, the upper plate being stationary and the lower plate adjustable, and each are provided with central openings, having reversely concaved walls to clamp against said head or ball. Screw standards engage the corners of said plates and are stationarily secured at their upper ends to the upper plate, said lower plate being freely movable over said standards which latter have their upper portions enlarged but not screw threaded. Clamping disks are adapted to engage the screw-threaded portions of the standards and bear against the underside of the lower plate.

590,752. Photographic Camera Shutter. W. P. Cook, Ivy Mills, Pa.

This improved Camera Shutter comprises a base-plate having an exposure opening and a rotatable shield having an opening which may be moved across the exposure opening. Teeth are formed in the edges of this shield and are adapted to be engaged by a suitable pawl. A lever is also provided, having a broad face adapted at times to cover the exposure openings, and so arranged as to set the shield when moved in one direction, and when moved in the opposite direction to release the pawl and permit the operation of the shutter.

590,766 Kinetographic Camera. F. Morand, Aix-les-Bains, France.

Means are provided for causing a pellicle to pass across a window, a screen being adapted to revolve in a center laterally of the window. Said screen is provided with a sector-shaped recess, the remainder being composed of transparent colored sectors, the sum of the colors of which, with equal quantity and radiation, are equivalent to white light.

590,838. Means for Guiding Kinetoscopic Films, etc. L. E. Henriet, Newark, N. J.

This patent was granted for mechanism for moving picture carrying strips or films consisting of a main frame, suitably guided and reciprocated by a cam, and a second frame pivoted to the first and oscillated by a second cam on the same shaft which carries the first cam. The reciprocating frame carries a box with one side forming a jaw supporting the film, the second frame carrying a jaw adapted to move in said box against the side supporting the film, and thereby clamping the film and forcing the same to follow in the motion.

590,922. Stereoscope Frame. H. S. Walbridge, North Bennington, Vt.

The hood of a stereoscope is provided at its lower portion with curved extensions, having inclined front edges and extending upwardly between the lenses into contact with each other and secured to the end wall of the hood, whereby the lower portion of the hood will be closed to effectually exclude the light. A partition is formed between the lenses.

591,347. Photographic Shutter. W. V. Esmond, N. Y., assignor to the E. & H. T. Anthony Co., same place.

A movable wing is provided with an exposure aperture and has a spring plate attached thereto. A flat, perforated diaphragm is adapted to be slipped under this spring plate and held by the resiliency of the latter against the face of the wing.

591,466. Lens. Louis Gathmann, Chicago, Ill.

This is an achromatic lens formed of a plurality of lenses assembled in the ordinary manner and each comprising a plurality of members or sections situated side by side in the same plane and forming in conjunction with each other a complete lens and secured within a frame, the lenses composing the achromatic lens consisting of material having the same coefficient of expansion and contraction.

591,877. Camera Holder. Isaac F. Pheils, Woodville, Ohio.

A suitable base is provided with two spring-controlled flaps or wings at opposite ends thereof adapted to clasp a camera on opposite sides, and to fold inwardly into substantially the same plane as the base. Means are provided for securing said base upon the top of a stick or staff.

592,148. Photographic Plate Wrapper. C. A. Lindsay, Washington.

A light-proof envelope or wrapper for photographic plates is formed with a detachable or removable side or front of the same material as the body thereof, and having a transverse slit at one end. Means are provided for excluding the light therefrom, and a pulling piece is attached to one end of the front and extended beyond the opposite end.

592,575. Stereopticon. W. S. Scales, Everett, Mass., assignor to Edmund Hudson, Hartford, Conn.

In connection with a stereopticon employing a light and lens back of a display opening, an auxiliary chamber is used, said chamber communicating with the light compartment of the stereopticon and having an opening at the front beside the display opening of the latter. A screen is employed for said display opening and another screen for said auxiliary chamber.

TRADE MARKS.

30,564. Dated September 21, 1897. The word "Biograph" applied to Consecutive-View or Moving Picture Apparatus. American Mutoscope Company, New York, N. Y.

30,681. Moving Picture Apparatus. American Mutoscope Company, New York, N. Y.

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